

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 DAI 1,9 1
2. Edition

En

PES 4 M 50 C 320/3 RS 44

EP/RSV 350-1500 MOB 119 DR
EP/RSV 350-1500 MOB 120 DR

supersedes 11.65
company Daimler-Benz
engine OM 621.931
OM 621.916
(Unimog 421-40 PS
or 34 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	1,9-2,2	0,3			
	9	0,7-1,2				
	18	3,7-4,6				
200	9	0,6-1,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
	mm	mm rev/min	4	5	6		rev/min	mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 52	1500	16	without auxiliary spring			ca. 20	350	8	1480	0
2a	1550	12,5					with auxiliary spring	200		
	1600	8,4	350	7,7-8,3	1000	0,9-1,1				
	1580	8,5-11	600	4,4-6,2	500	0,9-1,1				
	1650	5,0-6,6	800	0 - 4						
	1750	3,2-5,2	1050	0 - 1						
1800	0 - 1									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

	2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limit Note changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
	rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
	1	2	3	4	5	6	7	8	9
20°	1480	33,0-34,0	1510-1530	1000	34,2-36,2	100	20 mm RW		
				500	33,2-35,2				
40°	1480	32,7-33,7	1510-1530	1000	34,0-36,0				
				500	33,0-35,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

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The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV 350-1500 MOB 120 DR

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control			
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11		
ca.52	1500	16	without auxiliary spring			ca.20	350	8	1480	0		
	1550	12,4								200	19-21	1200
	1600	8,4	with auxiliary spring				350	7,7-8,3	1000	0,7-0,9		
2a	1580	8,5- 11							600	4,4-6,2	500	1,1-1,3
	1650	5,0-6,4							800	0 - 4		
	1750	1,6-4,0							1050	0 - 1		
	1900	0 - 1										

C. Settings for Fuel Injection Pump with Fitted Governor

	2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ...	3a Fuel delivery characteristics		Starting fuel delivery Idle		5		4a Idle stop	
	rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9		
20°	1480	27,7-28,7	1510-1530	1000 500	29,7-31,7 28,4-30,4	100	20 mm RW				
40°	1480	27,4-28,4	1510-1530	1000 500	29,4-31,4 28,2-30,2						

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = $\frac{\text{rev/min decreasing pressure} - \text{in bar gauge pressure}}{\text{increasing}}$

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

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Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 i
1. Edition

En

PES 4 M 50 A 320 RS 14 EP/MN 60 M 14 d
S 14 z

supersedes -
company Daimler-Benz
engine OM 621.913
(O/L 319 D - 50PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	15	2,9-3,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
2,6+0,1	500-480	10	-	-	-	-	405* 435 450 500	12,7-12,9 8 - 12 5 - 10 0 - 5,6	75 180 350	15,3-15,4 14,5-14,9 13 -13,4

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col.	
1850	405	28,7-29,7	1400	300	28,2-30,2		** See page 2	2
			800	95	31,7-33,7			
			250	ca.450	4,5-10,5 dispersion max. 1,5			

Checking values in brackets

1.62

B. Governor Settings

S 14 z with .. M 14 d DAI 1,9 i -2-

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mmw c 4	Control rod travel mm 5	Vacuum mmw c 6	Control rod travel mm 7	Vacuum mmw c 8	Control rod travel mm 9	Vacuum mmw c 10	Control rod travel mm 11
2,6+0,1	500-480	10	-	-	-	-	405*	11,8-12	75	14,4-14,5
							435	6,6-11,1	180	13,6-14,1
							450	4 - 9,6	350	12 - 12,5
							500	0 - 5,5		

control rod travel test (cols 4-11)
= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle
rev/min 1	Vacuum mm wat col 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat col 8	mm cm ³ /1000 strokes 8
1850	405	25,2-27,7 (25,7-26,7)	1400 800	300 95	25,2-27,2 (28,7-30,7)		**	
			250	ca.440 dispersion max.	4,5-10,5 1,5			

Checking values in brackets

* Set breakaway between 410-and 430 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 405 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 405 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 2.0±0,5 mm less - than in full-load position measured at 405 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

.. Further increase WG until control rod is set to 2.0 mm less control-rod travel than that measured in full-load position and with WG 405 mm.

... If the spring retainer is correctly set, the control-rod travel must now be 1.1 ± 0.5 mm less.

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 HAN 1,8 b
1. Edition

En

PES 4 M 50 B 320 RS 39

EP/MN 60 MA 5 D, MA 18 D, 30 D
EP/MN 60 MA20DR, MA 21 DR

supersedes -
company Hanomag
engine D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	15	2,9-3,6	0,2			
	9 18	0,8-1,1 3,9-4,6				
200	9	0,7-1,0				

Adjust the fuel delivery from each outlet according to the values in ()

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
1,0+0,1	500-480	10					565	12,1*	200	13,1-13,2
							650	2,8-8,2	300	12,9-13,2
							750	1,5-3,0	450	12,2-12,5

* Breakaway at 600-620 mm WG by inserting shims beneath governor spring.
control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col.	
2000	565	30,7-31,7	1400	300	29,2-31,2	See page 2		
			500	0	27,2-29,2			
			250	1000	6,5-11,5			
			dispersion max. 1,5					

Checking values in brackets

11.66

B. Governor Settings

MA 20 DR, MA 21 DR HAN 1,8 b

-2-

Torque control travel mm 1	Leakage		Control rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w c 4	Control rod travel mm 5	Vacuum mm w c 6	Control rod travel mm 7	Vacuum mm w c 8	Control rod travel mm ** 9	Vacuum mm w.c. 10	Control rod travel mm 11
0,7+0,1	500-480	10	330	14,4			*350 380 400	14,4 7,5-13,2 3,0-10,2	25 100 200	15,1-15,2 14,9-15,1 14,5-14,7
* Breakaway at 350-375 mm WG by inserting shims beneath governor spring.										

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle
rev/min 1	Vacuum mm wat col 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat col 8	mm cm ³ /1000 strokes 8
1500	330	28,7-30,2	1000 500	150 45	27,9-30,4 27,7-30,7			

Checking values in brackets

** Setting of idle stop (for MA 5 D and MA 18 D):

At $n = 500$ and with lug cam disconnected, move control rod to full-load position by increasing WG to 565 mm and measure control-rod travel obtained. Further increase WG until the control rod is set to 2.0 mm less control-rod travel than that measured in the full-load position at WG 565 mm; slowly press lug cam into end position.
If the spring retainer is correctly positioned, the control rod must be set to 0.8 ± 0.3 mm less control-rod travel than that measured in the full-load position with WG 565 mm.

** Setting idle stop (for M 20 R and M 21 R):

At $n = 500$ and with lug cam disconnected, move control rod to full-load position by increasing WG to 350 mm. Measure control-rod travel, further increase WG until control-rod travel is 4 mm less than that measured with WG 350; slowly press lug cam into end position.

If the spring retainer is correctly set, the control rod must now exhibit 3.2 ± 0.2
- 0.3 less control-rod travel than originally measured with WG 330.

No starting quantity measurement: however the excess travel of the spring-mounted full-load stop is to be checked (4.1 - 0.5 mm). (Only for M 21 DR)

Testoil-ISO 4113

En

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 HAN 1,8 c

1. Edition

En

PES 4 M 50 C 320 RS 39

EP/MN 60 M 22 DR (V933D)

supersedes -

company

Hanomag

engine

D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **1,7 + 0,1** mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,6	0,2			
	9 18	0,8-1,1 3,9-4,6				
200	9	0,7-1,0				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col.	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
1,2+0,1	500-480	10	-	-	-	-	530	12,2*	175	13,4-13,5
							575	5,7-11,4	275	12,9-13,3
							675	0 - 2,5	375	12,3-12,7

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes
rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	
1	2	3	4	5	6	7	8	
2000	530	30,7-31,7	1400	320	29,2-31,2		** b.w.	
			500	0	27,2-29,2			
			250	dispersion max.	6,5-11,5 1,5			

Checking values in brackets

2.67

* Breakaway at 550-570 mm WG by inserting shims beneath governor spring.

** Setting idle stop

At $n = 500$ and with lug cam disconnected, move control rod to full-load position by increasing WG to 530 mm and then measure control-rod travel obtained. Further increase WG until control rod has adjusted to 2.0 mm less control-rod travel than that measured in full-load position at WG 530 mm; slowly press lug cam into end position.

If spring retainer is correctly positioned, the control rod must adjust to 1.3 ± 0.3 mm less control-rod travel than that measured in full-load position with WG 530 mm.

No starting quantity measurement: however the excess travel of the spring-mounted full-load stop is to be checked (4.1 - 0.5 mm).

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 KHD 1,7 a
1. Edition

En

PES ³/₄ M 60 A ⁴²⁰/₃₂₀ RS 34 EP/RSV 300-1500 M2 B307
 EP/RSV 300-1500 M2 B309D
 PES ³/₄ M 60 A 320 RS 18 EP/RSV 300-1500 M 1/14
 EP/RSV 300-1500 M 1/14

supersedes -
 company KHD
 engine F³/₄ L 310

PES 4 M 60/320 RS 19
 All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,5-3,0	0,3			
	9 18	1,0-1,7 5,5-6,3				
200	9	0,2-0,9				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/m.n			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3				7	8	9	10	11
ca. 63	1500	16,0	without auxiliary spring			ca. 24	300	8,0	1480	0
	1560	12,0					150	20,5-21,0		
2a	1620	7,6	with auxiliary spring				300	7,7- 8,3	360	1,2-1,8
	1600	7,6-10,1					450	2,8-5,2		
	1700	2,2- 4,8					700	0 - 1		
	1800	0,3-1,7								
	1850	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 4a Idle stop	
Test oil temp 40°C (104°F)	Note: changed to ... rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1480	27,5-29,5	1520						300	8,0

Checking values in brackets

* 1 mm less control rod travel than col 2

3.67

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 Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.63	1500 1560 1620 1590 1700 1850	16,0 12,0 7,6 8,3-10,6 2,2- 4,9 0,3- 1,0	without auxiliary spring		auxiliary	ca.24	300 150 300 500 820	8,0 20,5-21,0 7,7- 8,3 4,0- 6,0 0 - 1	1480 1400 1200 800 400	0 0 0,5-0,7 1,1-1,3 1,6-1,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Idle stop	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1480	27,2-29,2	1520	1100 500	23,7-26,7 25,2-28,2			300	8,0

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

300 - 1500 M 1/14
Control lever Vertical - 30°

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.54	1500 1540 1580 1550 1650 1800	16,0 11,8 7,2 9,6-11,8 2,0- 4,4 0 - 1	without auxiliary spring		auxiliary	ca.12	300 120 300 480 650	8,0 20,5-21,0 7,7- 8,3 1,4- 4,2 0 - 1	1480 500 360	0 0 1,2-1,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1480	27,5-29,5	1520						

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 HAN 1,8 a
2. Edition

En

PES 4 M 50 B 320 RS 37,Z,Y EP/RSV 300-1200 M2 B117DR
 RS 45,Z,Y
 RS 37, 45 EP/RSV 300-1200 M2 B117DR*
 RS 37, 45 EP/RSV 300-1500 M2 B322DR**

supersedes 11.66
 company Hanomag
 engine D 301

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	0,8-1,2	0,2			
	12 15	1,8-2,4 2,8-3,4				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3				7	8	9	10	11
ca. 45	1200	14,0	without auxiliary spring			ca. 19	300	7,5	1180	0
	1240	10,4					150	20,5-21,0	1050	0,5-0,7
2a	1270	6,8	with auxiliary spring				300	7,3- 7,8	900	1,1-1,3
	1250	7,7-9,7					500	3,6- 5,7	800	1,4-1,6
	1300	4,7-6,0					800	0 - 1	400	1,4-1,6
1500	0,3-1,0									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to) rev/min				Idle			
rev/min	cm ³ /1000 strokes	3	4	5	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	
1	2				6	7	8	9	
1180	24,2-25,2	1220	850	27,9-29,9					
			500	26,4-28,4					
1180	21,7-22,7	1220	850	24,7-26,7	Z				
			500	24,7-26,7					
1180	22,7-23,7	1220	850	26,2-28,2	Y				
			500	25,2-27,2					

Checking values in brackets

* 1 mm less control rod travel than col 2

3.67

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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A13

A 13

B. Governor Settings

300-1300 M2 B117DR*

HAN 1,8 a

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 49	1300 1350 1390 1360 1400 1560	14,0 9,4 5,2 7,5-9,5 4,2-5,8 0 - 1	without auxiliary spring with auxiliary spring			ca. 20	300 150 300 500 740	7,0 20,5-21,0 6,7- 7,3 2,5- 4,8 0 - 1	1280 1100 900 500	0 0,5-0,7 1,3-1,5 1,6-1,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1280	24,2-25,2	1320	850 500	26,7-28,7 26,7-28,7				

Checking values in brackets

Testoil-ISO 4113

* 1 mm less control rod travel than col. 2

B. Governor Settings

300-1500 M2 B322DR**

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 60	1500 1550 1600 1550 1600 1800	14,0 10,0 5,9 9,0-10,5 4,8- 7,0 0 - 1	without auxiliary spring with auxiliary spring			ca. 23	300 150 300 500 800	7,0 20,5-21,0 6,7- 7,3 3,0- 5,0 0 - 1	1480 1000 800 500	0 0,7-0,9 1,4-1,6 1,4-1,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1480	25,4-26,4	1520	1200 850 500	23,7-25,7 26,9-28,9 26,4-29,4				

Checking value - brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 MB 1,9 k
2. Edition

PES 4 M 50 A 320 RS 14 EP/MN 60 M 15 D, 16 D; 19DR
RS 14 Z M 15 D, 16 D

supersedes 3.65
company: Daimler-Benz
engine: OM 621.912
(190 D - 55 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	15	2,9-3,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mmw.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
1,2+0,1	500-480	10	-	-	-	-	480*	13,7	150	14,9-15,0
							530	6,7-13,7	275	14,5-14,9
							600	0 - 6,7	375	13,9-14,2
							700	9,1-10,1	Set cam!	

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col.	
governors 2000	15D, 16D:	32,7-33,7	1600	330	31,2-33,2	See page 2!	**	
	480		1000	100	31,7-33,7			
governors 2000	19D:	31,7-32,7	1600	330	30,2-32,2			
	480		1000	100	30,7-32,7			
			250	ca. 570	4,5-10,5			
			dispersion max.		1,5			

Checking values in brackets

12.74

B. Governor Settings

RS 14 Z with governors 15D, 16D

MB 1,9 k

-2-

Torque control travel mm 1	Leakage		Control rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w c 4	Control rod travel mm 5	Vacuum mm w c 6	Control rod travel mm 7	Vacuum mm w c 8	Control rod travel mm ** 9	Vacuum mm w.c 10	Control rod travel mm 11
1,2+0,1	500-480	10	-	-	-	-	480*	12,8	150	14 -14,1
							530	6,6-12,8	225	13,8-14,1
							600	0 - 6	375	13,0-13,3
							700	8,8- 9,8	Set	cam!

control rod travel test (cols 4-11)
 = rotational speed 500 rev/min
 adjust breakaway (cols 4-5) by means of shims*
 cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104 F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle
rev/min 1	Vacuum mm wat col 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat col 8	mm cm ³ /1000 strokes 8
2000	480	29,7-30,7	1600	300	28,2-30,2		**	
			1000	100	28,7-30,7			
			250	ca.540	4,5-10,5			
				dispersion max.	1,5			

Checking values in brackets

Testoil-ISO 4113

* Set breakaway between 500-and 530 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 480 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3,5 mm less control-rod travel - than in full-load position and measured at 480 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2,7 \pm 0,5$ mm less - than in full-load position measured at 480 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Pe 14, Z:

... Further increase WG until control rod is set to 3,0 mm less control-rod travel than that measured in full-load position and with WG 480 mm.

... If the spring retainer is correctly set, the control-rod travel must now be $2,5 \pm 0,5$ mm less.

En

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 f
1. Edition

En

PES 4 M 50 A 320 RS 14 EP/MN 60 M 9 d

supersedes -
company Daimler-Benz
engine OM 621.913
(O/L 319 D-50PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	15	2,9-3,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in:

B. Governor Settings

Torque control travel mm	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control		
	Vacuum pressure drop mm water col.	Time at least s	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
2,5+0,1	500-480	10	-	-	-	-	440*	12,4-12,7	50	14,9-15	
								8,2-12,2		200	14,1-14,4
								0 - 5		400	12,7-13

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes
rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	
1	2	3	4	5	6	7	8	
2000	440	29,2-30,2	1400	300	28,2-30,2		** See page 2!	
			800	95	31,7-33,7			
			250	ca.480	4,5-10,5			
			dispersion max.		1,5			

Checking values in brackets

8.61

* Set breakaway between 450-and 470 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 445 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 445 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2.0 \pm 0,5$ mm less - than in full-load position measured at 445 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 g
2. Edition

En

PES 4 M 50 A 320 RS 14 EP/MN 60 M 11 d
RS 14 z

supersedes 8.61
company Daimler-Benz
engine OM 621.914
(180 DC-48 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	15	2,9-3,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
2,1+0,1	500-480	10	-	-	-	-	520 560 600 700	11,9* 10,2-11,5 7,8- 9,5 2,6- 5,4	100 200 400	13,9-14 13,6-13,9 12,2-12,6

control rod travel test (cols 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			Idle (stop)** Idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col	
1900	510	27,7-28,7	1000 500	150 0	28,7-30,7 27,7-29,7		** See	page 2
			250	ca.610	4,5-10,5			

dispersion max. 1,5

Checking values in brackets

10.61

B. Governor Settings

DAI 1,9 g

-2-

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w c 4	Control rod travel mm 5	Vacuum mm w c 6	Control rod travel mm 7	Vacuum mm w c 8	Control rod travel mm ** 9	Vacuum mm w.c. 10	Control rod travel mm 11
2,1+0,1	500-480	10	-	-	-	-	520 560 600	11,0* 9,2-10,5 7 - 8,5	100 200 400	13,1-13,2 12,7-13 11,4-11,7

control rod travel test (cols 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104 F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat col 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat col 8	
RS14Z 1900	510	24,7-25,7	1000	150	25,7-27,7		**	
			500	0	24,7-26,7			
			250	ca.590 dispersion max.	4,5-10,5 1,5			

Checking values in brackets

* Set breakaway between 530-and 550 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At n = 500 and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 510 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 510 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel 1,5±0,5 mm less - than in full-load position measured at 510 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

En

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 DAI 1,9 e
1. Edition

En

PES 4 M 50 A 320 RS 14

EP/MN 60 M 7 d
M 8 d

supersedes -
company Daimler-Benz
engine OM 621, 912
(190 D - 55 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC) / RW 18

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	15	2,9-3,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in []

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mm w.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
1,6+0,1	500-480	10	-	-	-	-	565* 595 670	13,3-13,6 8,5-12,8 3,2- 5,6	100 300 380 540	14,9-15 14,9-15 14,4-14,7 13,4-13,7

control rod travel test (cols. 4-11)
= rotational speed 500 rev/min.
adjust breakaway (cols. 4-5) by means of shims*
cam adjustment (B 8-9 - C 7-8) by means of shims**

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col. 8	
2150	560	31,2-32,2	1400 500	310 0	30,7-32,7 29,2-31,2		** See page 2	

Checking values in brackets

8.61

* Set breakaway between 560-and 590 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 560 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3.0 mm less control-rod travel - than in full-load position and measured at 560 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2.0 \pm 0,5$ mm less - than in full-load position measured at 560 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Note: This change also alters the initial tension in the spring retainer. It is therefore to be returned to the prescribed initial tension of 50-90 g again by inserting shims between spring and bottom of spring bolt.

With cam set and governor control lever pressed through in STOP direction, control rod must assume control-rod travel 0.

①

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 DAI 4,6 g (4,6 h)

2. Edition

40

En

PES 6 A 80 B 410 RS 64

RQ 1075 A 90

supersedes 9.59

company: Daimler-Benz

engine: OM 312

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,5-6,0	0,3			
	6 15	2,2-3,0 11,6-12,8				
200	6	1,3-2,2				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever mm 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever mm 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever mm 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
30°	1040 1080 1120 1140 1190	18-22 13-16 5,6-11,3 0,5-8,5 0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) rev/min 1		cm ³ /1000 strokes 2	Rotational-speed limitation intermediate speed rev/min 3	Fuel delivery characteristics high idle speed rev/min 4	cm ³ /1000 strokes 5	Starting fuel delivery idle switching point rev/min 6	cm ³ /1000 strokes 7	Torque-control travel rev/min 8	Control rod travel mm 9
1050	53,0-55,0		1075						

Checking values in brackets

* 1 mm less control rod travel than col. 2

A23

A23

BOSCH

 Geschäftsbereich KM, Kundendienst, Kfz-Ausrüstung.
 C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany
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Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 DAI 4,6 x (4,6x1)

2. Edition

En

PES 6 A 70 B 410 RS 64

RQV 250 - 1400 A 140 D

supersedes

8.58

company:

Daimler-Benz

engine:

OM 312

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	6,5-7,0	0,4			
	6 18	1,2- 1,9 11,1-11,9				
200	6	0,6- 1,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ①a ②a	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③	rev/min 10	mm 11
65±1,5	1400	15 - 17,6				10±1,5	150	7,4-8	1400	0
	1440	11,6-15					250	5,4-7,4	1200	0,4-0,6
	1520	4,4-9,6					400	3,6-4	800	0,8-1,0
	1600	0 - 4,2					700	1,7-3,4	500	0,8-1,0
	1660	0					950	0		

Torque control travel a = 1,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	43,5-45,5	1400-1420	500 1400	44,5-47,5 45,5-48,5	100	mind.7,9		

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.64

Testoil-ISO 4113

BOSCH

Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung.
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Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 MB 2,2 d

1. Edition

En

PES 4 M 55 C 120 RS 49 EP/RSV 350-2000 MO B124D (1)
EP/RSV 350-1500 MO B126D (2)
EP/RSV 350-1750 MO B127D (3)

supersedes -
company Daimler-Benz
engine OM 615 (60PS-1)
OM 616.915 (52PS-2)
OM 616.930 (60PS-3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,1-2,6	0,3			
	9 18	1,1-1,7 4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Control lever vertical = scale 50°
350-2000 MO B124D (1)

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 55	2000 2060 2120	16,0 13,0 8,2	without auxiliary spring			ca. 18	350	8,5	1980	0
2a	2100 2200 2400	8,0-11,0 3,2- 6,0 0 - 1				with auxiliary spring				200 350 600 700 1100

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to .) rev/min		Note: changed to .) rev/min		Idle		Control rod travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9	
2000	35,2-37,2	2020	1600 1000	34,7-37,7 32,2-35,2	100 350	ca. 20mmRW 4,5-10,5 dispersion max.1,5			

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.71

B. Governor Settings

350-1500 MO B126D (2)

MB 2,2 d -2- ①

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 52	1500 1550 1600 1550 1700 1900	16,0 12,6 8,5 11,8-13,4 3,2- 5,4 0 - 1	without auxiliary spring with auxiliary spring			ca. 20	350 200 350 600 1000	7,5 19-21 7,2-7,8 4,1-5,9 0 - 1	1480 1000	0 0,2-0,4

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1500	39,2-41,2		1000	39,2-41,2	350	4,5- 10,5 dispersion max.1,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Control lever vertical = scale 50°
350-1750 MO B127DR (3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 63	1750 1800 1860 1800 2000 2200	16,0 13,0 8,0 12,0-13,5 1,5- 4,5 0 - 1	without auxiliary spring with auxiliary spring			ca. 21	350 200 350 700 1100	8,0 19,0-21 7,7-8,3 2,4-5,3 0 - 1	1730 1400 600	0 0,2-0,4 0,8-1,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1730	40,2-42,2	1770	1000	39,2-42,2	100	ca. 20 mm RW		
					350	4,5-10,5 dispersion max.1,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

③

Test Specifications Fuel Injection Pumps ③ and Governors

VDT-WPP 001/4 MB 2,2 a
2. Edition

PES 4 M 55 C 320 RS 47, Z

EP/MN 60 M 23 DR (1)*
EP/MN 60 M 26 DR (2)
EP/MN 60 M 34 DR (3)
EP/MN 60 M 36 DR (4)

supersedes -
company: Daimler-Benz
engine: OM 615. ..
912-PKW220D (1)
910-L/0 309 (2)
936 Tunnelling or mining vehicles
HHF (3-4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 +0,1 mm (from BDC)

RW 18

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	12	2,1-2,6	0,3			
	9 18	1,1-1,7 4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Torque control travel mm	Leakage		Control rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col.	Time at least s	Vacuum mmw.c.	Control rod travel mm	Vacuum mmw.c.	Control rod travel mm	Vacuum mmw.c.	Control rod travel mm	Vacuum mmw.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
1,1±0,1	500-480	10	-	-	-	-	470	13,8**	200	14,8-15,0
** Breakaway at 490-510 mm WG by inserting shims beneath governor spring.							510	8,3-13,8	300	14,5-14,9
							550	2,6- 9,7	400	13,8-14,2
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**							Set cam!			
							550	10,6-11,4		
							650	9,7-10,6		

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control road travel from full-load to idle
rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	cm ³ /1000 strokes	rev/min	Vacuum mm wat. col.	mm cm ³ /1000 strokes
1	2	3	4	5	6	7	8	8
2250 (1-3)	470	35,7-36,7 (35,2-37,2)	1600 1000	325 135	36,4-37,9 34,2-35,7	250	4,5-10,5	cm ³ /1000 dispersion max. 1,5
							*** ./.	

Checking values in brackets

5.72

B. Governor Settings

..23DR, 26DR, Pe..S 47 Z

MB 2,2a

-2-

3

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mmw.c. 4	Control rod travel mm 5	Vacuum mmw.c. 6	Control rod travel mm 7	Vacuum mmw.c. 8	Control rod travel mm 9	Vacuum mmw.c. 10	Control rod travel mm 11
1,1±0,1	500-480	10	-	-	-	-	470	12,9**	200	13,9-14,1
** Breakaway at 490-510 mm WG by inserting shims beneath governor spring.							510	7,6-12,8	300	13,4-13,8
							550	1,8- 8,6	400	12,9-13,2
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**							Set cam!		550	9,6-10,5
							650	8,8- 9,7		

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col. 8	mm cm ³ /1000 strokes 9
2250	470	32,2-33,2	1600	325	32,9-34,4	250	4,5-10,5	5 cm ³ /1000
			1000	135	30,7-32,2	dispersion max. ***		1,5
1750	450	34,7-35,7	250		4,5-10,5	.. 3,5 mm		less
(4)			dispersion max. 1,5			.. 1,5±0,5mm	***	less

"Z"
(1-2)

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

..36 DR Pe..S 47

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mmw.c. 4	Control rod travel mm 5	Vacuum mmw.c. 6	Control rod travel mm 7	Vacuum mmw.c. 8	Control rod travel mm 9	Vacuum mmw.c. 10	Control rod travel mm 11
0	500-480	10	-	-	-	-	450	13,6**	-	-
** Breakaway at 475-590 mm WG by inserting shims beneath governor spring.							490	6,7-13,6		
							550	1,9- 9,3		
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**							Set cam!		550	11,4-12,4
							650	10,6-11,6		

** Setting the idle stop:

At n = 500 and with governor stop cam switched off bring the control rod to the full-load position by increasing the water column to 470 mm and measure the control-rod travel reached. Increase the water column further until the control rod has adjusted itself to 3,5 mm less travel than in the full-load position and with water column 470 mm. In this position press the stop cam slowly through to the end position and observe the control rod.

If the spring retainer is correctly adjusted, the control rod must adjust itself to a 2,7±0,5 mm lower control-rod travel than when measured in the full-load position and with water column 470 mm. If more or less than the adjusting value is reached, the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

En 321 Checking values in brackets

B22

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 MB 2,2 b

2. Edition

En

PES 4 M 55 C 120 RS 49

EP/RSV 350-1500 MOB119DR
EP/RSV 350-1750 MOB122DR*
EP/RSV 350-2150 MOB327DR**

supersedes 1.68
company Daimler-Benz
engine OM 615.911*
914**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 mm (from BDC) RW 18

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
	(2)					
1000	12	2,1-2,6	0,3			
	9 18	1,1-1,7 4,1-4,9				
200	9	0,5-1,0				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

350-1500

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 52	1500 1550 1600	16,0 12,5 8,4	without auxiliary spring			ca. 20	350	8	1480	0
2a	1580 1650 1750 1800	8,5-11,0 5,0- 6,6 3,2- 5,2 0 - 1					with auxiliary spring			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limit Note changed to) rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery idle		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1480	34,7-35,7	1520	1000	36,2-38,2	1000	20,0		
			500	34,2-36,2	High idle speed			
			350	7,5-11,5 dispersion max. 1,5	1585	7,5-8,5		

Checking values in brackets

* 1 mm less control rod travel than col 2

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B. Governor Settings

350-1750*

MB 2,2 b

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 63	1750 1800 1880 1800 1900 2150	16,0 13,0 7,3 12,0-14,0 5,5- 7,0 0 - 1	without auxiliary spring with auxiliary spring			ca. 21	350 200 350 600 800 1100	8,0 20,5-21 7,7- 8,3 4,6-6,3 0 -4,2 0 -1	1730 1200 800 500	0 0,3-0,5 0,8-1,0 0,8-1,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1730	37,2-38,2	1770	1440 1000 500	34,2-36,2 35,7-37,7 33,7-35,7	350	0,7-1,1 dispersion max.0,15		

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

350 - 2150**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 60	2150 2200 2280 2200 2400 2550	16,0 13,2 8,0 12,5-14,0 1,5- 4,3 0 - 1	without auxiliary spring with auxiliary spring			ca. 19	350 200 350 600 800 1060	8,0 20,5-21 7,7- 8,3 4,6- 6,4 1,0- 4,3 0-1	2130 1800 1400 600	0 0 1,0-1,2 1,0-1,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
2130	35,7-36,7		1600 1000	35,9-37,9 32,4-34,4	100	20 mm RW 0,4-1,0	350	8,0
						dispersion max.0,15		

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ③ and Governors

VDT-WPP 001/4 MB 2,2 c
1. Edition

En

PES 4 M 55 C 320 RS 47

EP/MN 60 M 27 DR
EP/MN 60 M 29 DR
EP/MN 60 M 35 DR

supersedes -
company: Daimler-Benz
engine: OM 615

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 ± 0,1 mm (from BDC) max. RW

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 5	Fuel delivery cm ³ /100 strokes 6	Spring pre-tensioning (torque-control valve) mm 7
1000	12	2,6-2,9	0,3			
	9 18	1,4-2,0 -				
200	9	0,8-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Torque control travel mm 1	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. 2	Time at least s 3	Vacuum mmw.c. 4	Control rod travel mm 5	Vacuum mm w.c. 6	Control rod travel mm 7	Vacuum mm w.c. 8	Control rod travel mm 9	Vacuum mm w.c. 10	Control rod travel mm 11
0,8±0,1	500-480	10	-	-	-	-	470 510 550 650	13,5* 7,5-13,5 2,1- 9,1 0 - 2,6	150 350	14,2-14,4 13,8-14,2
control rod travel test (cols. 4-11) = rotational speed 500 rev/min. adjust breakaway (cols. 4-5) by means of shims* cam adjustment (B 8-9 - C 7-8) by means of shims**							550 650	10,2-11,2 9,4-10,4	Set cam! "	

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm ³ /1000 strokes 8
rev/min 1	Vacuum mm wat. col. 2	cm ³ /1000 strokes 3	rev/min 4	Vacuum mm wat. col. 5	cm ³ /1000 strokes 6	rev/min 7	Vacuum mm wat. col. 7	
2250	470	34,7-35,7 (34,2-36,2)	1600	325	34,9-36,9		**	
			1000	125	31,4-33,4			
			250 dispersion max.		4,5-10,5 1,5			

Checking values in brackets

12,74

* Set breakaway between 490-and 510 mm WG by inserting shims WMS 22 S 18-19 X beneath governor spring.

** Adjustment of idle stop:

At $n = 500$ and with the governor stop cam out of engagement, bring the control rod into full-load position by increasing the column of water to 470 mm and measure the control rod travel obtained. Increase column of water further until the control-rod has adjusted to 3,5 mm less control-rod travel - than in full-load position and measured at 470 mm column of water. In this position, slowly force the stop cam up to the end position and observe control rod.

If the spring retainer is correctly adjusted, the control rod must adjust to a control-rod travel $2,7 \pm 0,5$ mm less - than in full-load position measured at 470 mm column of water. If the setting is lower or higher, then the position of the spring bolt in the spring retainer must be changed by inserting appropriate shims.

Test Specifications Fuel Injection Pumps ② and Governors

PES 6 AM 90 B 410 R 2, R 5, R 9
RS 2001

RQ 250/1075 A 223 D

supersedes 3.64
company: Daimler-Benz
engine: OM 315 91

"diesel" = flap touching
"gasoline" = flap free-standing

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed- rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,9-6,4	0,4			
	6 15	2,3- 3,1 14,2-15,5				
200	9	3,8- 4,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 6		Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 10		Control rod travel mm 12		
1000	14,2-15	1000	14,6	1080	14,4-14,6	530	0	100	6,8-8	400	16	-21	15,3-15,6	14,8-15	14,6-14,7			
				1100	10 -14,6			200	5,4-7,6									600
				1120	4 -11			300	3 - 5									800
				1140	0 - 8,5			380	0 -2,5									900
				1200	0			430	0									

Torque-control travel
on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
1050	96,5- 98,5					500	94,5-98,5	100	mind.13,4				
1000	120,5-124,5					700	92,5-95,5						

Checking values in brackets

10.68

Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 MB 8,3 q (8,3 r)
2. Edition

En

PES 6 A 80 B 410 RS 64 RQ 250/900 A 83 D

supersedes 3.64
company: Daimler-Benz
engine: OM 315

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,5- 6,0	0,4			
	6 15	2,2- 3,0 11,6-12,8				
200	6	1,3- 2,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		① Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		④ Control rod travel mm 4		Test specifications Control rod travel mm 5		rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		③ Torque control rev/min 11		Control rod travel mm 12							
850	14,8-15,6	850	15,2	900	14,8-15,2	520	0	200	6 - 8	400	16-21	850	15,2	920	9 - 15,2	300	3,4-5,8	500	15,4-15,7	600	15 - 15,2	940	3 - 12	370	0 - 1	1000	0	420	0

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		② cm ³ /-1000 strokes 2		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		③b		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		⑥ Control rod travel	
880	96,0-98,0	500		500	93,5-97,5	700	92,0-95,0	100	mind. 13,4										

Checking values in brackets

10.68

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 2,2 r

2. Edition

En

PES 4 M 65 B 420 LS 35 V	EP/RSV 250-..M 1 A 110 D
LS 55 U	M 1 A 111 D
LS 35 T	M 1 A 112 D
LS 35 S	M 1 A 113 D
LS 35 R	M 1 A 115 D

supersedes 4.62
company IHC
engine DD 132, DD 148

EP/RSV 250-1200 M 2 A 109 D
M 2 A 114 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7				
200	9	1,5-2,3				
	18	6,7-7,5				
	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV 250-750 M 1 A 110 D

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.45	750	16	without auxiliary spring			ca.26	250	9	730	0
2a	800	12				with auxiliary spring			100	19-19,5
	830	8,6	250	8,7- 9,3						
	820	8,5-11,5	400	5 - 7						
	900	4 - 6,4	500	0,5- 5						
	1050	0 - 1			700	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note changed to) rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery idle 5		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
730	34,0-36,0	760	500	36,5-39,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.65

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C9

C9

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.42	750 790 820 800 900 1050	16 11,8 8,3 9,5-12 3 - 5,5 0 - 1	without auxiliary spring			ca.23	250 100 250 400 500 650	9 19-19,5 8,7- 9,3 4,8- 6,8 0 - 4,8 0 - 1	730 500	0 0,6-0,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
730	38,0-40,0	760	500	42,0-45,0				

LS 35 R

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.49	900 950 980 960 1000 1050 1150	16 11,6 8 8,2-11,4 5,8- 7,8 2,5- 5,5 0 - 1	without auxiliary spring			ca.24	250 100 250 400 500 700	9 19-19,5 8,7- 9,3 5 - 7 0 - 5 0 - 1	880 700 500	0 0,4-0,6 0,7-0,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
880	32,5-34,5	910	500 700	36,5-39,5 35,5-37,5				

LS 35 V

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

EP/RSV 250-900 M 1 A 112 D

IHC 2,2 r

-3-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 49	900 950 970 950 1000 1200	16 11,4 9 10-12,4 6 - 8 0 - 1	without auxiliary spring			ca. 24	250 100 250 400 500 700	9 19-19,5 8,7- 9,3 5 - 7 0 - 5 0 - 1	880 700 500	0 0,2-0,4 0,4-0,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
880	38,5-40,5	910	500 700	42,0-45,0 40,0-42,0				

LS 35 T

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-1000 M 1 A 110D, 115D*)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 54	1000 1050 1070 1060 1100 1150 1250	16 11 8,4 8 - 11 5 - 7 1,8-4,6 0 - 1	without auxiliary spring			ca. 25	250 100 250 400 500 700	9 19-19,5 8,7- 9,3 5 - 7 0 - 5 0 - 1	980 700 500	0 0,7-0,9 1,0-1,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
980	32,0-34,0	1010	500 700	36,5-39,5 35,5-37,5	*			

LS 35 S

* 1 mm control-rod travel more than at n 500 and control lever max. (at 115 D)

Checking values in brackets

* 1 mm less control rod travel than col 2

En

CAA

C11

B. Governor Settings

EP/RSV 250-1000 M.1 A 112 D IHC 2,2 r

-4- (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm		
1	2	3	4	5	6	7	8	9	10	11		
ca. 54	1000	16	without auxiliary spring			ca. 25	250	9,3	980	0		
	1050	11							100	19-19,5	700	0,3-0,5
	1070	8,6							250	9- 9,6	500	0,7-0,9
	1050	10-12	with auxiliary spring				400	5,2- 7,4				
	1100	5,7-7,8							500	0,8- 5,4		
	1150	2,2-5,4							700	0 - 1		
	1250	0 - 1										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
980	37,5-39,5	1010	500	42,0-45,0				
			700	40,0-42,0				

LS 35 T

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

EP/RSV 250-1200 M 2 A 109 D, 114 D*

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm		
1	2	3	4	5	6	7	8	9	10	11		
ca. 54	1200	16	without auxiliary spring			ca. 25	250	9	1180	0		
	1300	10,4							100	19 -19,5	700	0,7-0,9
	1330	8,2							250	8,7- 9,3	500	1,0-1,2
	1300	9 -11,5	with auxiliary spring				400	6,5- 8				
	1400	4,4- 6,6							500	4,4- 6,8		
	1500	0,5- 3,8							600	1,5- 5,5		
	1650	0 - 1							900	0 - 1		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1180	34,0,36,0	1210	500	36,5-39,5	*			
			700	35,5-37,5				

LS 35 V

* 1 mm control-rod travel more than at n 500 and control lever max. (at 114 D)

Checking values in brackets

* 1 mm less control rod travel than col 2

C12

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4

1. Edition

En

PES 4 M 65 B 320/3 RS 43

EP/RSV 350-1100 M 2 B 317 DR

supersedes -

company

engine

Vendeuvre
F 118

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

1,7 +0,1

mm (from BDC)

RW 16

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,2-3,7	0,2			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			Control-lever deflection in degrees 7	Lower rated speed		Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 46	1100 1160 1220	16 12 7,2	without auxiliary spring			ca. 23	350	8,5	1080	0
(2a)	1200 1300 1500	7-10 3- 3,5 0- 1					with auxiliary spring			150 350 600 850

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop Test oil temp. 40°C (104°F)		(6) Rotational-speed limit Note changed to) rev/min	(3a) Fuel delivery characteristics		Starting fuel delivery Idle		(5) Idle stop	(4a) Control rod travel mm
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7		
1080	24,0-25,0	1100-1120	700	26,8-28,5	100	20 mm RW	350	8-8,5
			600	25,5-27,5				
			1160	5,5 - 6 mm RW				

Checking values in brackets

* 1 mm less control rod travel than col 2

10.64

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C13

C13

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4

1. Edition

En

PES 4 M 65 C 320 RS38

EP/RSV 350-1500 M2 B341 DR

supersedes -

company

Allis Chalmers

engine

D 118

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $1,7 +0,1$ mm (from BDC) max. RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,3-3,7	0,3			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control rev/min 10	Control rod travel mm 11
			4	5	6		rev/min 8	Control rod travel mm 9		
ca. 54	1500	16,0	without auxiliary spring			ca. 17	350	8,8	1480	0
	1550	10,4					200	20,5-21,0		
	1580	7,0					350	8,5- 9,1		
ca. 52	1500	ca. 11,6	with auxiliary spring				550	1,2- 5,0	450	1,2-1,8
	1550	ca. 6,5					720	0 - 1,0		
	1700	0,3-1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note changed to . . . rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1480	38,5-40,5	1500-1510	500	29,8-32,3	100	min. 20mmRW	350	11,5-15,5 cm ³ /1000 strokes

Checking values in brackets

* 1 mm less control rod travel than col 2

11.77

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C15

GAS

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 LANM 2,7 b
2. Edition

En

PES 4 M 65 B 420/3 LS 42

EP/RSV 400-1200 M2B 316 DR

supersedes -

See page 2

B 308) *
B 312)

company

John Deere/Lanz

engine

Schlepper T 700
M 405/48 PS

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,2-3,7				
200	9	1,5-2,3				
	9 20	0,5-1,3 5,0-6,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

EP/RSV 400-1200 M 2 B 316 DR

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.44	1200 1240 1280	16 12 8,4	without auxiliary spring			ca.19	400	7,5	1150	0
2a	1260	8 -10,8				with auxiliary spring			150	20,5-21
	1300	4,8- 6,5	400	7,2-7,8	900				1,2-1,4	
	1380	1 - 3,5	500	5,1-6,2	500				1,2-1,4	
	1460	0,3 - 1	600	2 -4,6						
				700	0 -2,7					
					800	0 - 1				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery Idle		5		4a Idle stop	
Test oil temp 40°C (104°F)	rev/min	cm ³ /1000 strokes	Note changed to) rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9		
1180	39,5-41,5			800 500	44,0-47,0 43,0-46,0			400	7,5	

Checking values in brackets

* 1 mm less control rod travel than col 2

9.64

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C16

CA6

B. Governor Settings

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control			
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11		
ca.44	1200	16	without auxiliary spring			ca.19	400	7,5				
	1240	11,8							150	20,5-21		
	1290	5,5							400	7,2-7,8		
	1250	9 -11,5							500	3,1-5		
	1300	4,4- 6							600	0 -2,2		
⑤	1360	1,8- 3,8				700	0 -1					
	1500	0,3- 1										

①A

C. Settings for Fuel Injection Pump with Fitted Governor

② Full-load stop		⑥ Rotational-speed limitation	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)						
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	
1180	41,0-43,0		⑥a		100	mind.20mmRW	400	7,5

Checking values in brackets

*1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = $\frac{\text{rev/min}}{\text{increasing}}$ decreasing pressure - in bar gauge pressure (g.p.)

Pump/governor	Setting		Measurement		Control rod travel-diminution difference
	(g.p.)	bar	(g.p.)	bar	
					mm (1)

Notes:

(1) when n = $\frac{\text{rev/min and gauge pressure}}{\text{bar (= maximum full-load control rod travel)}}$

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 LANM 2,7 a

2. Edition

En

PES 4 M 60 A 420/3 LS 36 EP/RSV 400/-1200 M 2 B 308
B 312

supersedes 6.63
company John Deere-Lanz
engine 700

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	2,5-3,0				
	9	1,0-1,7				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11		
ca. 44	1200	16	without auxiliary spring			ca. 19	400	7	1180	0		
	1240	11,8							150	20,5-21	600	0
	1290	5,5	with auxiliary spring				340	11,6-14,8	450	1,2-1,8		
2a	1240	10,8-12,6							400	7,5		
	1280	6 - 8,4							550	1,3- 3,6		
	1400	0,8- 3,4							700	0 - 1		
	1500	0,3- 1										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to .) rev/min						Control rod travel	
rev/min 1	cm ³ /1000 strokes 2	3	4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9	
1180	42,5-43,5						400	7	

Checking values in brackets

* 1 mm less control rod travel than col 2

1.65

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C18

C 1.8

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 REN 2,0 a

1. Edition

En

PES 3 M 65 B 320 RS 38 EP/RSV 275-1000 M5 B 315 D
F-PES 3 M 65 A 320 RS10F1 F-EP/RSV 275-1000 M4/1 F1d

supersedes: -
company Renault
engine 587

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 21

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,3-3,7	0,3			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

M5 B315D -

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 43	1000	16	without auxiliary spring			ca. 18	275	8	980	0
	1040	12,2					150	19 - 21	800	0,4-0,6
2a	1080	7,4	with auxiliary spring				275	7,7-8,3	600	1,1-1,3
	1080	6,5-9,2					500	3 - 5,5		
	1200	1,3-3,8					800	0 - 1		
1300	0 - 1									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5		4a Idle stop	
Test oil temp 40°C (104°F)	rev/min 1	cm ³ /1000 strokes 2	Note changed to) rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9		
	980	34,3-36,3	1010-1030	750 600	37,8-40,8 39,8-42,8						

Checking values in brackets

* 1 mm less control rod travel than col 2

11.64

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C19

C19

The numbers denote the sequence of the tests

B. Governor Settings

M4/1F1d Control lever vertical= scale 30°

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11		
ca. 30	1000	16	without auxiliary spring			ca. 9	275	8	980	0		
	1070	10										100
	1130	2	with auxiliary spring				275	7,7-8,3	600	1 - 1,2		
	1070	8,8-11,2									400	5,1-6,5
	1125	4,4-7									550	2 - 4,4
	1200	1,5-4,5									800	0 - 1
2a	1345	0 - 1										

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)	Fuel delivery characteristics		Starting fuel delivery Idle			Idle stop	
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 LANM 1,2 a

2. Edition

En

PES 2 M 60/320/3 RS 13

EP/RSV 250-1250 M 1/4 D
EP/RSV 250-1250 M 1/13D ./.

supersedes
company
engine

1.65
Johne-Deere-Lanz
LXA

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	2,5-3,0				
	9 18	1,0-1,7 5,3-6,3				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

..M1/4D Control lever vertical= scale 30°

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 37	1250	16	without auxiliary spring			ca. 8	250	7,5	1230	0
	1280	12					150	20,5-21	1050	0,2-0,4
2a	1310	8,2	with auxiliary spring				220	8,6-21	900	0,6-0,8
	1300	7,2-10,6					500	2,2-5,2	300	0,7-0,9
	1400	1,6- 3					750	0 - 1		
1540	0,3- 1									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop		
Test oil temp. 40°C (104°F)	rev/min 1	cm ³ /1000 strokes 2	Note changed to 1 rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
	1230	31,5-33,5		1260					
				1000 700	32,0-35,0 32,0-35,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

6.67

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C23

C23

The numbers denote the sequence of the tests

..M1/13D Control lever vertical= scale 30°

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11		
ca.42	1250	16,0	without auxiliary spring			ca.11	250	8,0	1120	0		
	1280	13,2							150	20,5-21	1000	0,1-0,3
	1320	9,2							250	7,7-8,3	900	0,2-0,4
2a	1320	7,4-10,5	with auxiliary spring				400	5,2-6,6	900	0,2-0,4		
	1380	4,3-6,4					500	2,2-5,2	350	0,2-0,4		
	1450	0,6-3,8					600	0 - 3,5				
	1550	0 - 1,0					750	0 - 1				

C. Settings for Fuel Injection Pump with Fitted Governor

Testoil-ISO 4113

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery idle		5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)								Control rod travel mm	
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1230	34,3-36,3	1260	900	500	35,5-38,5						
					35,5-38,5						

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = $\frac{\text{rev/min}}{\text{decreasing pressure - in bar gauge pressure}}$ / $\frac{\text{rev/min}}{\text{increasing pressure}}$

Pump/governor	Setting	Measurement	Control rod travel
	Gauge pressure = bar	Gauge pressure = bar	mm (1) diminution difference

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 2,2 1 (2,2 m)

2. Edition

En

PES 4 A 60 B 420 LS 105
LS 105 R

EP/RSV 250-950 A 4/42 D

supersedes
company
engine

2.62
IHC
DD 132 S
DD 132

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	4,5-5,0	0,3			
	6 18	0,5-1,2 8,3-9,1				
200	6	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 54	950 980 1010	14 10 5	without auxiliary spring			ca. 22	250	5,8	930	0
2a	980	8 - 11				with auxiliary spring			100	19 - 21
	1000	4,8- 8	250	5,5-6,1	600				0,6-0,8	
	1050	1,8-3,8	350	3 -4,5	300				0,6-0,8	
	1080	0 -2,5				450	0 -2,5			
	1150	0 -1				550	0 -1			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)	Control rod travel		6 Rotational-speed limit Note: changed to) rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery Idle 5		4a Idle stop	
	rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
	930	42,5-44,5	960	500 700	43,0-46,0 44,0-46,5	At n = 700 delivery must be greater than at n = 500.			
R	930	29,0-31,0	960	500 700	29,0-32,0 31,0-33,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.64

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D1

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 EIC 3,9 a

1. Edition

En

PES 4 A 80 D 420 RS 1277	EP/RSV 300-1000 A1 B643D (1)	supersedes	-
RS 1277Z	B643D (2)	company	EICHNER
RS 1277	B670D (3)	engine	EDK 4-10:75PS(1)
RS 1278	B643D (1)		4- 8:65PS(2)
PES 6 A 80 D 420 RS 1280	300-1050 A1 B671D (4)		4- 9:55PS(3)
			6- 3:100PS(4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	4,6-5,0	0,4			
200	6	2,0-2,8				
	6	0,1-0,7				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

300-1000 A1 B643 (1,2)

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 55	1000	16,0	without auxiliary spring			ca. 26	300	6,0	P.1277: P.1277Z: 0 1000 0 500 0,5-0,7	
	1050	11,2					100	19-21		
	1100	5,5					300	5,7-6,3		
2a		1070	with auxiliary spring				360	2,6-4,2		
		1120					460	0 - 1		
		1200								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 4a Idle stop	
Test oil temp 40°C (104°F)	rev/min	cm ³ /1000 strokes	Note changed to .) rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
	1	2	3	4	5	6	7	8	9
(1)	1000	62,0-64,0	1020	500	54,0-57,0	100	16,0-16,6		
(2)	1000	52,0-54,0		800	51,5-54,5				
				500	49,0-52,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

4.73

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D2

02

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.55	1000 1050 1100 1080 1120 1180	16,0 11,6 5,6 6,0-9,5 1,5-5,4 0 - 1	without spring		auxiliary	ca.26	300 100 300 370 460	6,0 19-21 5,7-6,3 2,0-3,7 0 - 1	980 400	0 0,6-0,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(3) 1000	44,5-46,5	1020	800 500	42,0-45,0 41,5-44,5	100	16,5-17,1		

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

300-1050 A1 B671D (4)

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.60	1050 1100 1160	16,0 12,0 5,6	without spring		auxiliary	ca.28	300 100 300	6,0 19-21 5,7-6,3	1050 400	0 0,3-0,5
ca.58	1070 1150 1220	ca.9,0 ca.3,5 0 - 1	with auxiliary spring				450 600	1,5-3,7 0 - 1		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(4) 1050	54,0-56,0	1070	800 500	52,0-55,0 48,0-51,0	100	16,5-17,1 mm RW		

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 FOR 2,4 a
3. Edition

PES 4 M 70 C 321 RS 52 EP/RSV 500-1500 MOB 335R **En**
500-1800
300-1800 MOB 338DR **n**
300-1800 MOB 343DR

supersedes -
company Ford
engine York

PES 4 M 70 C 321 RS 54 EP/RSV 300-1800 MOB 333DR
PES 4 M 70 C 321 RS 55 EP/RSV 300-1800 MOB 333DR
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,7 + 0,1 mm (from BDC) RW21

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,5-5,0	0,3			
200	9	2,7-3,5				
	15	8,1-9,1				
	9	1,3-2,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
	mm	mm rev/min	4	5	6		rev/min	mm	rev/min	mm
2	3					8	9	10	11	
②a	See page 2									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limit Note changed to) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		④a Idle stop	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
See page 3								

Checking values in brackets

* 1 mm less control rod travel than col 2

8.77

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D4

24

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

500-1500 MO B 335										
ca.49	1500	16,0				ca.21	500	7,3	1480	0
	1560	10,9	*				250	20,5-21	700	0
	1620	6,9					500	7,0-7,6	500	0,6-0,8
ca.47	1500	ca.9,5					650	2,3-4,2		
	1530	ca.4,7	**				840	0 - 1		
	1650	0,3-1,0								

500-1800 MO B 335

ca.68	1800	16,0				ca.26	500	7,3	1480	0
	1860	12,6	*				250	20,5-21	700	0
	1950	6,6					500	7,0-7,6	500	0,6-0,8
ca.64	1800	ca.49,8					650	3,1-4,7		
	1900	ca. 4,4	**				780	0 - 1		
	2000	0,3-1,0								

300-1800 MO B 333 D - Pe ..S54

ca.54	1800	12,0				ca.14	380	5,5	1780	0
	1940	9,0	*				100	20,5-21	1200	0,3-0,5
	2100	4,6					300	7,2-8,6	500	1,0-1,2
ca.51	1830	9,2-9,6					380	5,3-5,8		
	2000	4,0-4,9	**				700	2,1-4,2		
	2300	0,3-1,0					1100	0 - 1		
300-1800 MO B 333 D - Pe ..S55						ca.20	380	5,5	1780	0
ca.66	1800	12,0					100	20,5-21	1200	0,3-0,5
	2000	8,8	*				300	7,6-8,4		
	2200	4,8					380	5,2-5,8		

ca.58	1830	8,4-8,6					700	2,4-4,3	500	1,0-1,2
	2000	4,1-5,0	**				1140	0 - 1		
	2300	0,3-1,0								
300-1800 MO B 338 D						ca.20	380	5,5	1800	0
ca.67	1800	12,0					100	20,5-21	1200	0,4-0,6
	2000	9,0	*				300	7,5-8,6	500	1,1-1,3
	2200	6,9					380	5,2-5,8		
ca.60	1800	ca.9,2					800	1,0-3,6		
	2000	ca.5,4	**				1160	0 - 1		
	2280	0,3-1,0								

300-1800 MO B 343 D						ca.22	380	7,0	1800	0
ca.50	1820	10,0					100	20,5-21	1000	0,8-1,0
	1860	8,0	*				300	7,7-8,6	400	1,1-1,3
	1920	4,6					380	5,9-7,1		
	1820	9,4-10,6					800	1,4-3,1		
	1960	2,8- 4,1	**				1060	0 - 1		
	2120	0,3- 1,0								

Note: Tightening torque of delivery-valve holder 0-2,5-0,5-0-2,8+0,2 mkp
Cam sequence and angular cam spacing 1-2-4-3 90° in each case; test with overflow valve

Testoil-ISO 4113
C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Test oil temp 40°C (104°F)		Rotational-speed limitation RQV Control-rod stop RQ	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7
*	..52 **	500-1500 MO B335:			100	mind. 94,5
1500	39,0-41,0	1530: 0,5-1,5 mmRW ***			500	12,5-16,5
					1570	3,5-5,5 mmRW
*	..52 **	500-1800 MO B335:			100	mind. 94,5
1800	39,0-41,0	1830: 0,5-1,5 mmRW ***			500	12,5-16,5
					1880	3,5-5,5 mmRW
*	..52 **	300-1800 MO B338D:			100	mind. 94,5
1800	37,5-39,5	1825-1835	1000	36,0-39,0	300	5,5 - 9,5
			500	29,0-32,0	2000	4,3 - 4,8 mmRW
*	..52 **	300-1800 MO B343D:			100	mind. 94,5
1800	39,0-41,0	1830-1840: 1 mmRW ***	1000	37,0-40,0	300	12,5-16,5
			500	30,0-33,0	1910	max. 14,5
*	..54 **	300-1800 MO B333D:			100	mind. 94,5
1800	37,5-39,5	1825-1835	1000	36,0-39,0	300	14,5-16,5
			500	29,0-32,0	2000	4,3-4,8 mmRW
*	..55 **	300-1800 MO B333D:			100	mind. 94,5
1800	31,5-33,5	1825-1835	1000	32,5-35,5	300	14,5-16,5
					2000	4,3-4,8 mmRW

* pump

** with governors

*** less than
column 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 1,8 k
2. Edition

En

PES 3 M 65 A 320/3 LS 35 Y EP/RSV 250-..M 1 A 110 D
LS 35 X A 112 D
LS 35 W A 113 D
A 115 D

supersedes 12.64
company IHC
engine DD 99
DD 111

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 18

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	3,2-3,7	0,3			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

250-750 M 1 A 110 D

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.45	750	16	without auxiliary spring			ca.26	250	9	730	0
	800	12					100	19-19,5		
	830	8,6	with auxiliary spring				250	8,7- 9,3	500	0,4-0,6
2a	820	8,5-11,5				400	5 - 7			
	900	4 - 6,4				500	0,5- 5			
	1050	0 - 1	700	0 - 1						

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat Note: changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
X 730	32,5-34,5	760	500	34,5-37,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

3.65

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D10

D10

B. Governor Settings

250-750 M 1 A 112 D

IHC 1,8 k

-2-
①

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel ①	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 44	750 800 820 800 900 1050	16 11,8 9,6 10,6-12,6 4 - 6,5 0 - 1	without auxiliary spring			ca. 26	250 100 250 400 500 700	9,6 19-19,5 9,3- 9,9 5,8- 7,8 1,5- 5,8 0 - 1	730 500	0 0,4-0,6

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
W 730	36,5-38,5	760	500	39,5-41,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

250-900 M 1 A 110 D

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel ①	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 51	900 950 990 980 1050 1200	16 12,4 8 7,5-10,5 3,5- 6 0 - 1	without auxiliary spring			ca. 26	250 100 250 400 500 700	9 19-19,5 8,7- 9,3 5 - 7 0,5- 5 0 - 1	800 700 500	0 0,3-0,5 0,8-1,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
X 880	31,5-33,5	910	500 700	35,5-37,5 33,0-35,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

En

B. Governor Settings

250-900 M 1 A 113 D IHC 1,8 k -3-

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	900 950 980 950 1000 1200	16 11,8 8,6 10,5-12,6 6,5- 8,4 0 - 1	without auxiliary spring with auxiliary spring			ca. 25	250 100 250 400 500 700	9,6 19-19,5 9,3- 9,9 5,5- 7,6 1 - 5,8 0 - 1	880 700 500	0 0,2-0,4 0,6-0,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
W 880	36,5-38,5	910	500 700	39,5-41,5 37,5-39,5				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

250-1000 M 1 A 110 D, 115 D*

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 54	1000 1050 1070 1060 1100 1150 1250	16 11 8,4 8-11 5-7 1,8-4,6 0 - 1	without auxiliary spring with auxiliary spring			ca. 25	250 100 250 400 500 700	9 19-19,5 8,7- 9,3 5 - 7 0 - 5 0 - 1	980 700 500	0 0,7-0,9 1,0-1,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
X 980	31,5-33,5	1010	500 700	35,5-37,5 33,0-35,0	*	100	1 mm control rod travel more than at n = 500	

Checking values in brackets

* 1 mm less control rod travel than col. 2

The numbers denote the sequence of the tests

250-1000 M 1 A 112 D

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 54	1000 1050 1070	16 11 8,6	without auxiliary spring			ca. 25	250	9,3	980	0
2a	1050	10-12				with auxiliary spring			100	19-19,5
	1100	5,5-7,8	250	9- 9,6	500				0,7-0,9	
	1150	2,2-5,4	400	5,2- 7,4						
	1250	0 - 1	500	0,8- 5,4						
						700	0 - 1			

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery idle		5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)									
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
Y 980	36,0-38,0	1010	500	39,5-41,5							
			800	36,5-38,5							

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = _____ rev/min decreasing pressure - in bar gauge pressure
 increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = _____ bar	Gauge pressure = _____ bar	mm (1)

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 LAN 2,4 c

2. Edition

En

PES 4 M 60 A 320/3 LS 32
A 420/3 LS 32

EP/RSV 400-1200 M 2 B 306 D
311 D
400-1000 M 2 B 303 D
310 D
375-1250 M 2 B 116 D

supersedes: 11.64
company: John-Deere-Lanz
engine: 401
500

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	2,5-3,0	0,3			
	9 18	1,0-1,7 5,3-6,3				
200	9	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

EP/RSV 400-1200 M 2 B..D

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control rev/min 10	Control rod travel mm 11
			4	5	6		rev/min 8	Control rod travel mm 9		
ca.44	1200 1240 1280	16 11,8 6,7	without auxiliary spring			ca.19	400 150 400 600 800	7,5 20,5-21 7,3-7,7 2,2-4,6 0 - 1	1180 1000 800 500	0 0,2-0,4 0,5-0,7 0,5-0,7
2a	1240 1280 1400 1500	10,8-12,6 6 - 8,4 0,8- 3,4 0 - 1				with auxiliary spring				

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to) rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1180	35,5-37,5	1210-1230	1000 700 500	36,5-39,0 36,5-39,0 34,0-37,0			400	7,5

Checking values in brackets

* 1 mm less control rod travel than col 2

8.69

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D14

2/14

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control-2-travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.34	980 1010 1040 1040 1120 1250	16 12 7 6,3-8,5 2,8-4,6 0,3- 1	without auxiliary spring with auxiliary spring			ca.16	400 150 400 500 650 800	7,5 20,5-21 7,2-7,8 5 - 6 0 -3,4 0 - 1	960 820 550	0 0,6-0,8 0,6-0,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
960	31,7-33,7	980-995	900 700 500	32,7-35,2 33,0-35,5 31,0-34,0			400	7,5

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Torque-control travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.43	1250 1280 1310 1300 1400 1500	16 11,8 7,6 7,2-10,4 1,8- 4,2 0,3- 1,0	without auxiliary spring with auxiliary spring			ca.17	375 150 375 600 800	8 20,5-21 7,7-8,3 1,8-4,8 0 -1,0	1230 1100 900 500	0 0,1-0,3 0,6-0,8 0,7-0,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1230	35,5-37,5	1260-1270	800 400	37,0-40,0 34,0-38,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 SAV 2,2 a
1. Edition

En

PES 3 M 65 C 320 RS 38 (B)	EP/RSV 275-1000 M5 B325D (1)	supersedes	REN 2,3 b 1.68
	EP/RSV 275-1075 M5 B325D (2)	company	SAVIEM
	EP/RSV 250-1250 M5 B323D (3)	engine	715-30 (1-2,2)
	EP/RSV 350-1250 M8 B340 (4)		715-30 (2-2,2)
	EP/RSV 275-1075 M5 B326D (5)		592-50 (3-2,3)
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers			714-52 (4-2,5)
			714-30 (5-2,5)

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) / RW 21

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,3-3,7	0,3			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

275-1000 M5 B325D (1)

1 Upper rated speed rev/min Degree of deflection of control lever mm	Control rod travel mm	Control rod travel mm rev/min	Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
			4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 43	1000	16,0	without auxiliary spring			ca. 18	275	8,0	880	0
2a	1050	11,6				with auxiliary spring				150
	1180	7,6	275	7,7-8,3	500					1,0-1,2
	1050	10,5-12,5	500	3,0-5,5						
	1150	2,5-6,4	780	0 - 1						
	1320	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limit Note changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
980	39,0-41,0	1020	750	42,5-45,5	100	mind. 7,4	275	4,5-8,5
			500	44,0-47,0			1080	7,5-15,5

Checking values in brackets

* 1 mm less control rod travel than col 2

12.72

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D16

D16

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.46	1075	16,0				ca.18	275	8,0	1050	0
	1100	13,0	*				150	20 - 21		
	1150	7,5					275	7,7-8,3	800	0,5-0,7
	1120	10,0-12,0					500	3,0-5,5	400	1,0-1,2
	1200	4,0- 6,0	**				780	0 - 1		
	1380	0 - 1								
ca.60	1275	16,0				ca.22	250	8,5		
	1320	13,0	*				150	19 - 21	1260	0
	1380	8,2					250	8,2-8,8	1000	0,4-0,6
	1380	7,0-9,5					500	3,5-6,0	400	0,9-1,1
	1500	1,8-4,6	**				800	0 - 1		
	1650	0 - 1								
ca.62	1250	16,0				ca.22	350	8,0	1250	0
	1300	11,2	*				200	20,5-21		
	1340	7,0					350	7,7-8,3	600	0
	1300	10,5-12,0					500	2,1-4,5	400	1,2-1,8
	1400	2,9- 4,8	**				680	0 - 1		
	1540	0 - 1								
ca.46	1075	16,0				ca.18	275	8,0	1060	0
	1100	11,2	*				150	20,5-21		
	1150	7,0					275	7,7-8,3	800	0,3-0,5
	1120	10,0-12,0					450	4,4-6,2	400	0,3-0,5
	1200	4,8- 6,4	**				760	0 - 1		
	1380	0 - 1								

275-1075 M5 B325D (2) 250-1250 M5 B323D (3) 350-1250 M8 B340 (4) 275-1075 M5 B326D (5)

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Idle stop High idle speed ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	④a	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	cm ³ /1000 strokes 9
1060 (2)	40,0-42,0	1100:0,5-1,0 ****		750 500	43,0-46,0 44,0-47,0	100	ca.20 mm RW	275	3,5-7,5
1260 (3)	38,0-40,0	1280		1000 750 500	38,5-41,5 39,5-42,5 39,0-42,0	100	mind.7,9 ***	250	3,5-7,5 1300 7-1UmmRW
1250 (4)	49,0-51,0	1270:0,5-1,0 ****		600	45,0-48,0	100	ca.20 mmRW	350	4,5-8,5
1060 (5)	49,5-51,5	1100:0,5-1,0 ****		750 500	48,5-51,5 48,0-51,0	100	mind.7,4 ***	275	4,5-8,5 1150 17,5-25,5

When checking (column 2 and 5) increase by ± 0.5 cm³/100h

* without auxiliary spring

*** Control lever vertical

** with auxiliary spring

**** less than column 2!

En

D17

D17

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 SAV 2,7 a
1. Edition

En

PES 4 M 65 C 320 RS 38
(B)

EP/RSV 275-1250 M1 B321D (1)
EP/RSV 300-1250 M1 B330D (2)
EP/RSV 300-1400 M1 B332 (3)
EP/RSV 300- 750 M7 B339 (4)

supersedes -
company Saviem
engine 598-30 (1-2,7)
598-30 (2-2,9)
712-70 (3-3,3)
712-50 (4-3,3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 21!

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
200	12	3,3-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

275-1250 M1 B321D (1)

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Control-lever deflection in degrees rev/min 7 8 9			3 Torque control rev/min 10 11	
Control rod travel mm 2	Control rod travel mm rev/min 3					rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11	
ca.65	1275 1300 1315	12,0 9,0 6,5	without auxiliary spring			ca.23	275	7,3	1260	0
2a	1275	11,6-12,4				with auxiliary spring			100	20,5-21
	1300	7,5-9,5	275	7,0-7,6	500				1,0-1,2	
	1440	0 - 1	450	1,6-4,5						
						620	0 - 1			

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F) rev/min 1		6 Rotational-speed limit Note changed to) rev/min 3		3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5 Idle stop cm ³ /1000 Control rod travel mm 8 9	
cm ³ /1000 strokes 2				cm ³ /1000 strokes 5	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9		
1260	38,0-40,0	1280	1000	39,0-42,0	100	mind.7,9	275	3,5-7,5	
			750	39,5-42,5			High idle speed		
			500	39,0-42,0			1300	7-10 mm RW	

Checking values in brackets

* 1 mm less control rod travel than col 2

12.72

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D18

219

B. Governor Settings

EP/RSV ..

① Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 65	1270	12,0	**			ca. 22	300	7,3	1260	0
	1310	6,6					200	20,5-21		
	1270	11,5-12,5					300	7,0-7,6		
	1350	2,0-3,5					450	2,1-4,6		
	1450	0 - 1					620	0 - 1		
ca. 57 ②a	1400	16,0	**			ca. 21	300	8,0	500	1,0-1,2
	1480	10,6					150	20,5-21,0		
	1530	6,0					300	7,7-8,3		
							500	1,0-1,2		

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)	⑥ Rotational-speed limitat. Note: changed to ...)		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop		
	rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
(2) 1260	38,0-40,0	1280	1000	750	39,0-42,0	100	ca. 21 mm RW	300	3,5-7,5
(3) 1400	48,5-50,5	1430	600	500	39,5-42,5	100	mind. 7,4	1300	7-10mmRW
(4) 750	46,5-48,5	770	600	600	39,0-42,0			300	7,5-11,5
				600	43,0-46,0	100	ca. 20 mm RW	300	7,5-11,5
				600	46,0-49,0				

Checking values in brackets

When checking (column 2 and 5) increase by ± 0.5 cm³/100h

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

① Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 57	1460	11,0-12,6	***			ca. 21	450	2,6-5,2	350	1,2-1,8
	1550	3,9- 6,3					680	0 - 1		
	1660	0 - 1								
ca. 44 ②a	750	16,0	**			ca. 22	300	8,5	730	0
	770	11,6					200	19 - 21		
	790	6,4					300	8,2-8,8		
	775	9,2-11,3					400	2,6-5,2		

825 3,8- 5,2 mit Zusatz-
925 0 - 1 federn

540 0 - 1 340 1,2-1,8

300-1250 M1 B330D (2) 300-1400 M2 B332 (3) 300-750 M7 B339 (4)

** without auxiliary spring

*** with auxiliary spring

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4
1. Edition

En

PES 4 M 50/320 LS 6

EP/RSV 250-1200 M 1/5 d

supersedes -
company: Lans
engine: 75 CD

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC) RW 18

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	1,8-2,4	0,2			
	9 18	0,8-1,2 3,7-4,3				
200	9	0,7-1,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min 10	mm 11
ca. 40	1200 1240 1280 1280 1320 1380 1500	16 12,6 7,8 6-9 4-6 1,4-3,8 0 - 1	without auxiliary spring with auxiliary spring			ca. 11	250 100 250 400 600 750	8 19-21 7,7-8,3 5,3-6,6 0 -3,7 0 - 1	1180 900 600 300	0 0,5-0,7 1,2-1,4 1,6-1,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1180	31,7-33,7	1210-1230	900 400	33,7-36,7 33,7-36,7				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4
1. Edition

En

PES 2 M 65/420 L 2

EP/RSV 700-2500 M 6/3 d

supersedes -
company Lanz
engine BP 201

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,2			
	9 18	1,4-2,1 6,7-7,5				
200	9	0,6-1,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control		
	mm	mm rev/min	4	5	6		rev/min	mm		rev/min	mm
1	2	3	4	5	6	7	8	9	10	11	
ca. 49	2500	8	without auxiliary spring			ca. 10	750	7,5	2480	0	
	2580	6,4					300	19-21		2200	0,6-0,8
	2660	2,8					700	7,2-7,8		1800	1,5-1,7
2a	2500	7,8-8,4	with auxiliary spring				900	4,4-5,8	1400	2,3-2,5	
	2600	3,8-5,6					1100	0,4-3,8		1000	2,9-3,1
	2700	1,2-2,6					1400	0 - 1		700	2,9-3,1
	2850	0 - 1									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
2480	19,5-20,5	2510-2530	1000	28,0-30,0	200	mind. 5,9		
			1600	31,0-33,0				
			700	ca. 6,5 dispersion max. 10cm ³				

Checking values in brackets

* 1 mm less control rod travel than col 2

5.61

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D21

321

Test Specifications Fuel Injection Pumps **1A** and Governors

40

VDT-WPP 001/4 MWM 2,7 a

1. Edition

En

PES 4 A 65 ^B 320/3 RS1068 EP/RSV 300-1250 A2B398d

supersedes -

company MWM

engine

KD/AKD 110,5 V

Special features:
Top stop screw is set to stop setting.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,45 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	4,3-4,7	0,3			
	9 18	2,0-2,6 8,2-9,1				
200	9	1,4-2,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
			4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 48	1250 1300 1350	16 11,8 6,8	without auxiliary spring			ca. 19	300	6	1230	0
②a	1350 1420 1550	4,6-8,2 1,5-3,5 0,3-1				with auxiliary spring				100 200 300 500 700

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limit Note: changed to) rev/min 3	③a Fuel delivery characteristics		Starting fuel delivery Idle		④a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	38,0-39,0	1270	1000 600	36,5-38,5 38,0-41,0	-	-		

Checking values in brackets

* 1 mm less control rod travel than col. 2

6.63

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 2,2 k 1

2. Edition

En

PES 4 A 60 B 420 LS 105

EP/RSV 250-1200 A 1 A 18

supersedes 7.60

company IHC

engine DD 132

Special features: Regulator A 1 must be converted into A 2 (IHC 2.2 k 2) during repairs.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,5-5,0	0,3			
	6	0,5-1,2				
	18	8,3-9,1				
200	6	0,3-0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11		
ca.58	1200	16	without auxiliary spring			ca.20	250	5,5	1180	0		
	1220	12,4					100	19-21			400	0
	1250	7					250	5,2-5,8				
2a	1230	9-12	with auxiliary spring				300	3 - 4	290	1,2-1,8		
	1250	4-8,4					350	0 -2,5				
	1300	0,3-2,2					450	0 - 1				
	1360	0 - 1										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to . . . rev/min		Note: changed to . . . rev/min		Note: changed to . . . rev/min		Note: changed to . . . rev/min	
rev/min	cm ³ /1000 strokes	3	4	5	6	7	8	9	
1	2	3	4	5	6	7	8	9	
1180	32,5-34,5	1210							

Checking values in brackets

* 1 mm less control rod travel than col 2

12.64

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D24

024

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 2,2 q 1

2. Edition

En

PES 4 M 65 A 420 LS 35 T EP/RSV 300-1000 M 1 B 105 D
LS 35 Q EP/RSV 250-1200 M 2 B 121 D ./.

supersedes 10.64
company IHC
engine DD 148

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,3			
	9 18	1,5-2,3 6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

300-1000

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.62	1000	16	without auxiliary spring			ca.33	300	9	980	0
	1050	12,6					100	19-19,5		
2a	1100	8,6	with auxiliary spring				450	5,1-7	500	0,7-0,9
	1080	9-11,4					300	8,7-9,3		
	1150	4,2-6,5					450	5,1-7		
	1200	1,4-4,6					550	1 -5,2		
	1300	0 - 1					750	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp 40°C (104°F)	Note changed to)	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
rev/min	rev/min	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9
980	39,5-41,5	1010	500 800	42,0-45,0 40,0-42,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

8.69

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E1

E1

The numbers denote the sequence of the tests

250-1200

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.54	1200	16,0	without auxiliary spring			ca.25	250	9,0	1180	0
	1300	10,2					150	20,5-21		
	1330	8,2	250	8,7-9,3						
	1300	8,7-11,3	500	4,4-6,8						
②a	1400	4,2- 6,5	with auxiliary spring				880	0 - 1	800	0,6-0,8
	1620	0 - 1						350	1,2-1,4	

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)								Control rod travel mm	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	Control rod travel mm
1	2	3	3	4	5	6	7	8	8	9	9
1180	44,5-46,5	1220	700	500	47,0-50,0 48,5-51,5	100	1 mm control rod travel more than at n = 500				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = _____ rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = _____ bar	Gauge pressure = _____ bar	mm (1)

Notes:

(1) when n = _____ rev/min and gauge pressure = _____ bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 IHC 1,8 i
2. Edition

En

PES 3 M 65 A 320/3	LS 35Y	EP/RSV 250-950 M1 A108 D *	supersedes	10.64
(C)	LS 35Y	-1400 M2 A107 D *	company	IHC
	LS 35X	- 900 M1 A103 D **	engine	DD 111 *
	LS 35Y	- 950 M1 B125 D*		DD 99 **

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,7 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	3,2-3,7	0,3			
	9	1,5-2,3				
	18	6,7-7,5				
200	9	0,6-1,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

250-950 M 1 A 108 D*

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.56	950	16	without auxiliary spring			ca.29	250	9,5	930	0
	1000	12					100	19-19,5		
	1030	9					250	9,2- 9,8		
2a	1020	9-11,3	with auxiliary spring				400	6 - 7,8	700	0,6-0,8
	1100	3,5- 6,2					500	2 - 6		
	1250	0 - 1					720	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5a Idle stop	
Test oil temp. 40°C (104°F)	Note. changed to)	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	3	4	5	6	7	8	9		
930	43,0-45,0	960	500	43,0-46,0					
			700	41,5-44,5					

Checking values in brackets

* 1 mm less control rod travel than col 2

12.71

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E3

E3

B. Governor Settings

250-1400 M 2 A 107 D *

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 58	1400 1450 1500 1500 1600 1750	16 12,8 8,8 7,5-10 3 -5,5 0 - 1	without auxiliary spring with auxiliary spring			ca. 23	250 100 250 400 500 600 860	9,5 19-19,5 9,2- 9,8 7 - 8,5 4,6- 7,2 1,5- 6 0 - 1	1380 1000 500	0 0,5-0,7 1,5-1,7

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LS35Y*								
1380	35,5-37,5	1410	500 1000	36,0-39,0 33,5-36,5				

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

250-900 M 1 A 103 D **

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 58	900 950 1000 980 1050 1100 1250	16 12,6 7,8 8-10 4,5-6,8 2 - 5 0 - 1	without auxiliary spring			ca. 31	250 100 250 400 500 700	8,8 19-19,5 8,5- 9,1 5,4- 7 1,2- 4,4 0 - 1	880 700 500	0 0,3-0,5 0,8-1,0

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LS35X**								
880	31,5-33,5	910	500 700	34,5-37,5 33,0-35,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

The numbers denote the sequence of the tests

B. Governor Settings

250-950 M 1 B125 D*

Testoil-ISO 4113

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control rev/min 10	Control rod travel mm 11
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9		
ca.56	950 1000 1030	16,0 12,0 8,8	without auxiliary spring			ca.29	250	9,5	930 300	0 0,2-0,4
2a	1010 1100 1240	10,0-12,0 3,8-6,4 0 - 1				with auxiliary spring				

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit. Note: changed to ... rev/min 3	3a Fuel delivery characteristics		Starting fuel delivery idle		5	4a Idle stop	
rev/min 1	cm³/1000 strokes 2		rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7		rev/min 8	Control rod travel mm 9
LS 35Y* 930	40,0-42,0		700 500	38,0-41,0 39,5-42,5					

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = decreasing rev/min increasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 MWM 2,0 a
Edition 3.69

En

PES 3 A 65 B320/3 RS 462, 483 EP/RSV 300-1300 A2A89D
(C) RSV049 EP/RSV 300-1050 A0A87D
A0A153D*
A0162D*
supersede 2,0a (1.60)
company 2,0b (1.62)
engine KD 10,5 D
(35 PS / 2600)
*(28 PS / 2100) ./.
Fendt tractors

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,45 \pm 0,1$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	4,3 - 4,7	0,3			
	9	2,0 - 2,6				
200	18	8,2 - 9,1				
	9	1,4 - 2,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

..A2A89D, ..A0A87D

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 49	1300	16,0	without auxiliary spring			ca. 18	300	6,0	See page 2	
	1350	11,5					100	19 - 21		
	1400	6,5	with auxiliary spring				300	5,7-6,3		
2a	1350	10,6-12,4					400	4,0-5,0		
	1400	4,4- 8,0					500	1,4-3,6		
	1600	0 - 1					700	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note changed to)							
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	
1280	39,0 - 40,0	1320	800	41,0 - 43,0					./.

Checking values in brackets

* 1 mm less control rod travel than col 2

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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The nameplate described at MWM 1.5 a has recently been extended to 2 speeds and 2 deliveries - in column n = (speed) and Q = (full-load delivery) for more accurate setting in the case of governors with torque control.

The following points apply, deviating from WPP 001/4, Supplement 1, setting the governor and the pump:

(2) Setting according to nameplate n = (speed 1) and Q = (delivery 1); or according to columns 1 and 2

(3) Is contacted until change of control-rod travel, as read under (2), or (with new nameplate) until the 2 delivery is reached at speed 2; or according to columns 4 and 5

(6) Is adjusted according to nameplate n = (speed 1 + 20 rpm) or column 3

For repairs on Fendt tractors on which the new nameplate (with 2 speeds and 2 deliveries) has not yet been introduced, the full-load data apply - ordered according to engine types -

according to the above note

B. Governor Settings

..A0A153D, ..A162D*

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.40	1050 1100 1150	16,0 11,0 5,6	without auxiliary spring			ca.17	300	6,0	See page 3	
	1100 1180 1320	9,5-12,0 2,7- 4,3 0 - 1				with auxiliary spring				

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat.	3a Fuel delivery characteristics		Starting fuel delivery Idle		5	4a Idle stop	
Test oil temp. 40°C (104°F)	rev/min	cm³/1000 strokes	Note: changed to ...)	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	3	4	5	6	7	8	9
	1030	33,5 - 34,5	1060	800	34,5 - 36,5				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ② and Governors

En

PES 4 A 85 C 410 RS 2090	RQ 250/1200 AB588DL	(1)	supersedes	1.68
PES 4 A 85 C 410 RS 2195	RQ 250/1200 AB590DL	(2)	company:	OM Brescia
PES 4 A 90 C 410 RS 2195	RQ 250/1300 AB590DL	(3)	engine:	(Büssing OM)
(D)	RQ 250/1200 AB686 L	(4)		CO 2 D(1,2)
	RQ 250/1300 AV686 L	(5)		CO 3 D(3)
				CO3D-Var23(4,5)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,15 + 0,1$ mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery "C" 8,5 \emptyset cm ³ /100 strokes	Difference "D" cm ³ /100 strokes	Control rod travel mm	Fuel delivery "C" 9 \emptyset cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) "D" 9 \emptyset mm
1	2	3	4 8,5 \emptyset	2	3	6
1000	9	4,9 - 5,5	4,1-4,5	5,8-6,3	5,1-5,5	
	6 15	1,3 - 2,1 12,3 -13,1	0,6-1,4 - - -	2,5-3,4 13,6-14,3	1,6-2,6 - - -	
200	9	3,9 - 4,4	1,4-2,2	3,8-4,6	1,9-2,9	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

250/1200 AB588DL (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications ④		Setting point		Test specifications ⑤		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1100	14,6-15,4	1100	15,0	1220	14,8-15,0	490	0	100	5,3-7,4	400	15,8-16,7
				1270	10,0-15,0			150	4,7-6,8	600	15,5-15,9
				1260	5,4-12,0			250	2,8-4,8	800	15,1-15,5
				1300	0 - 7,0			350	0 -1,6	900	15,0-15,2
				1350	0			390	0		

Torque-control travel on flyweight assembly dimension a = $0,3$ mm 1 mm less control rod travel
Speed regulation: At

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes/mm
1	2	3	4	5	6	7
1180	62,2 - 68,2	600	900 600	61,7 - 64,7 56,5 - 59,5	100	ca.15 mm R _w

Checking values in brackets

B. Governor Settings

250/1200 AB590DL (2)

OMB 4,4 b -2- (2)

Checking of slider PRG check (1)		Full-load speed regulation (4)				Idle speed regulation (5)				Torque control (3)	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1150	14,7-15,3	1150	15,0	1200	14,7-15,0	540	0	100	6,5-8,1	500	15,7-16,2
				1250	7,0-12,4			200	5,2-7,2	600	15,2-15,6
				1300	0 - 7,5			300	3,0-5,2	700	15,0-15,3
				1370	0			440	0		

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever (2) Test oil temp. 40°C (104°F)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery idle speed (6)	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7
1180	66,0-68,0	600	900	61,0 - 64,0	100	ca.15 mm RW
			600	58,0 - 61,0		

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

250/1300 AB 59o DL (3)

Checking of slider PRG check (1)		Full-load speed regulation (4)				Idle speed regulation (5)				Torque control (3)	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1250	14,7-15,3	1250	15,0	1300	14,7-15,0	550	0	100	7,0-8,1	600	15,8-16,0
				1340	8,0-13,0			200	5,8-7,7	700	15,4-15,7
				1380	0 - 6,0			300	3,5-5,7	800	15,0-15,2
				1450	0			400	0 -2,5		
								450	0		

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation. At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever (2) Test oil temp. 40°C (104°F)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery idle speed (6)	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7
1280	71,0 - 73,0	500	1000	67,0 - 70,0	100	ca.15 mm RW
			700	66,0 - 69,0		
			500	60,0 - 63,0		

En Checking values in brackets

B. Governor Settings

250/1200 AB686L (4)

OMB 4,4 b

-3-

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16,0	1200	15,7-16,0	560	0	100	6,9-8,1	-	-
				1220	15,6-16,0			200	5,7-7,7		
				1250	10,0-14,9			300	3,4-5,7		
				1300	0 - 8,3			400	0 -2,6		
				1360	0			460	0		
Breakaway not before n = 1220		U/min									

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	5	6	7
1200	79,0 - 81,0	1200	800	74,5 - 77,5		100	ca. 21 mm RW

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

250/1300 AB686L

(5)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
600	15,6-16,4	600	16,0	1300	15,7-16,0	570	0	150	6,6-8,1	-	-
				1320	15,5-16,0			200	5,7-7,9		
				1350	10,2-14,8			300	3,6-9,8		
				1400	0 - 8,5			400	0 -2,7		
				1460	0			470	0		
Breakaway not before n = 1320		cht U/min									

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	5	6	7
1300	82,0 - 84,0	1300	800	77,0 - 81,0		100	ca. 21 mm RW

En Checking values in brackets

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 A 80 C 412 RS 2182 RQ 250/1400 AA 322 DL (1)
RQ 250/1500 AA 322 DL (2)
RQ 250/1400 AB 605 DL (3)

supersedes 8.66
company: Steyr
engine: WD 609

See page 3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,5 - 6,0	0,4			
	6 15	2,2 - 3,0 11,5 - 12,8				
200	6	1,3 - 2,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ 250/1400 AA 322 DL (1)

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	Control rod travel mm 12				
1300	14,4-15	1300	14,7	1400 1420 1450 1500 1580	14,4-14,7 11,0-14,7 6,0-12,0 0 - 7,6 0	510	0	100 200 250 300 350 410	6,2-8,1 4,6-6,8 3,6-5,8 2,0-4,4 0 -2,7 0	450 700 850	16,0-16,3 15,2-15,6 14,7-15,0

Torque-control travel on flyweight assembly dimension a = 0,4 mm + 0,05 Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3	Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /-1000 strokes 2	Control rod travel mm 3a	Control rod travel mm 3b	cm ³ /-1000 strokes 5	Control rod travel mm 6	cm ³ /1000 strokes/mm 7	Control rod travel mm 6
1380 without	54,5 - 56,5	500	1000 500	49,5 - 52,5 45,5 - 48,5		
1380 with	49,0 - 52,0					./.

Checking values in brackets

B. Governor Settings

RQ 250/1500 AA 322 DL (2)

STE 6,0 c -2-

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
1450	14,4-15	1450	14,7	1500	14,4-14,7	500	0	100	6,0-8,0	400	16,0-16,6
				1540	11,0-14,0			200	5,0-7,0	700	15,3-15,7
				1580	6,6-11,6			300	2,0-4,0	850	14,7-15,0
				1640	0 - 8			400	0		
				1740	0						

Torque-control travel on flyweight assembly dimension a = 0,4 mm +0,05 Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
②		③a	③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
1480	62,5 - 64,5	500	1000	55,5 - 58,5		
1480	57,0 - 60,0		500	53,0 - 56,0		

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

RQ 250/1400 AB 605 DL

(3)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
550	15,7-16,3	550	16,0	1400	14,5-14,8	510	0	100	6,2-8,2	900	15,8-16,0
				1430	10,0-14,4			200	4,7-6,8	1050	15,3-15,6
				1460	6,0-12,0			250	3,6-5,8	1200	14,8-15,0
				1500	0 - 8			300	2,0-4,4		
				1580	0			410	0		

Torque-control travel on flyweight assembly dimension a = 0,4 mm + 0,05 Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
②		③a	③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
without	- 0,6 bar		900	77,5 - 80,5		0,35 bar
1400	73,5 - 75,5	900 - 0,35 bar	500	55,0 - 58,0		0,1 bar
with	- 0,6 bar					
1400	70,0 - 74,0					

En Checking values in brackets

Setting of manifold-pressure compensator - governor .AB 605 DL

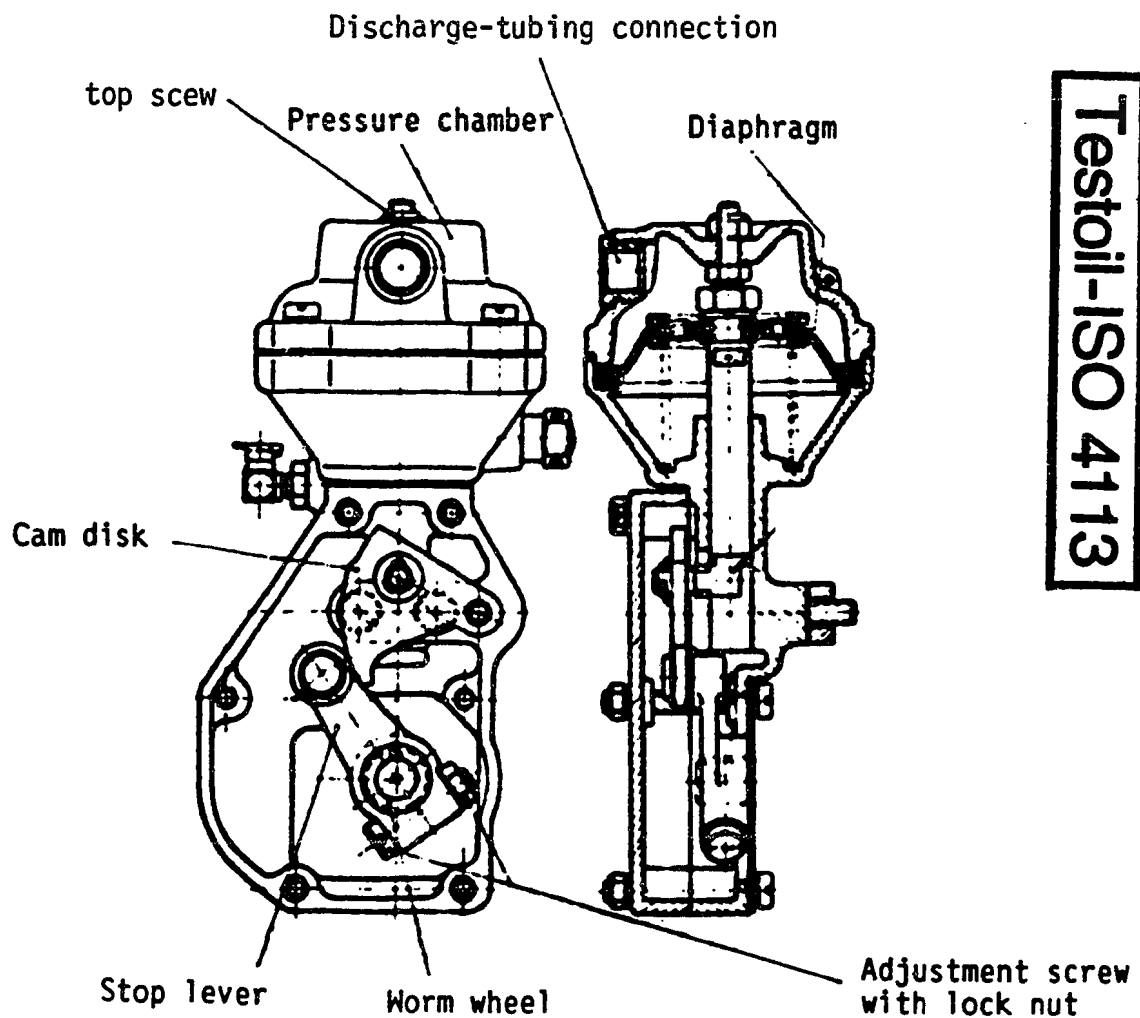
1. Connect up compressed air at discharge-tubing connection of diaphragm.

The charge-air pressure/gauge pressure can be set with compressed air, commercially available reducing valve and pressure gauge 0 - 3 atg.

2. Set full-load delivery at stop lever by turning adjustment screw (worm and worm wheel - roller makes contact with cam disk). Always tighten lock nut after performing adjustment!
3. Set full-load stop screw such that it makes slight contact - there must be no change in control-rod travel!
4. Test fuel-delivery characteristics - by changing charge-air pressure.

Whenever charge-air pressure is changed, move control lever back and re-position it.

5. Check: at $n = 900 \text{ min}^{-1}$, there must be no change in control-rod travel between 0.35 atg and 0.6 atg!
6. Set control-rod stop at $n = 900 \text{ min}^{-1}$ and 0.35 atg.



Test Specifications Fuel Injection Pumps ① and Governors

DAI 8,3 u
3.66

En

PES 6 AM 90 B 410 R 3; R 5; R 9 RQV 250-1075 A 278 D
RS 2001

supersedes 3.64
company: Daimler-Benz
engine: OM 315

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,15 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,9 - 6,4	0,4			
	6 15	2,3 - 3,1 14,2 - 15,5				
200	9	3,8 - 4,6				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min 10	mm 11
65±1,5	1075	14 - 17,5				10±1,5	200	5,7-7,8	800	0
	1120	9,6- 13,8					300	3,9-5,4	700	0 - 0,3
	1160	6,0- 10,4					400	2,8-4,7	600	0,3-0,5
	1200	2,0- 7,0					600	0 -2,0	500	0,4-0,6
	1280	0					720	0		

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery idle switching point 6	Torque-control travel 5		
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	91,0 - 93,0	1080-1100	500 1000 1075	92,0-96,0 94,0-97,0 94,0-97,0	100	mind.13,4	900	

Checking values in brackets

* 1 mm less control rod travel than col. 2



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Test Specifications Fuel Injection Pumps ① and Governors

PE 12 P 120/920 LS 6 EP/RSUV 250-900 P10/303 DR
(V 8225 D)

supersedes
company: Henschel
engine: 12 V 1516

1 - 6 - 7 - 10 - 3 - 2 - 11 - 8 - 5 - 4 - 9 - 12 je 30°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,0^{+0,1}_{-0,05}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	9	16,4 - 17,0				
	6 12	9,4 - 10,6 21,8 - 24,3				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 61	900 920 940 920 950 1000 1050	16,0 10,6 5,0 8,8-11,9 3,8- 4,8 1,0- 2,6 0,3- 1,0	without auxiliary spring with auxiliary spring			ca. 22°	250 100 250 350 580	7 19 - 21 6,7-7,3 5,5-6,1 0 - 1	300 600 450	0 0,9-1,1 1,9-2,1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
880	ca. 10 mm RW	910 - 920						
Carry out adjustment on engine								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ② and Governors

PE 6 P 100/720 RS 15 RQ 250/1200 PA 22 D

supersedes

company: Daimler-Benz
engine: OM 346

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,8 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3				
	6 9	2,6 - 3,4 5,9 - 6,7				
200	9 12	2,5 - 3,3 6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	Control rod travel mm 12				
600	15,7-16,3	600	16,0	1200 1250 1300 1360	15,6-16,0 8,0-13,0 0 - 7,8 0	580	0	200 300 400 480	6,5-8,1 4,4-6,6 0,8-3,6 0		

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /-1000 strokes 2	Control rod travel mm 3a	Control rod travel mm 3b	cm ³ /-1000 strokes 5	Control rod travel mm 6	Control rod travel mm 7		
1190	112,0 - 113,5	500	700 450	110,0-112,5 99,5-102,5	100	15 - 17	

Checking values in brackets

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/421 RS 185	RQ 300/1100 PA143DR (1)
	RQV250-1100 PA139DR (2)
PE 6 P 120/421 RS 187	RQ 300/1000 PA145DR (3)
	RQV250-1000 PA144DR (4)

supersedes -
company: Saurer
engine: D 1 K (1,2)
D 1 KL(3,4)

Cam sequence and angular spacing:
1 - 4 - 2 - 6 - 3 - 5 je 60° and WPP 110/2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 10 Ø cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery 12 Ø cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4-13,2	0,5	12	18,2-19,0	0,8
600	9	5,3- 6,5		6	4,0- 5,0	
600	12	11,3-12,8		12	15,8-17,5	
600	15	17,2-19,0		15	24,5-26,8	
200	9	3,6- 4,6		6	1,7- 2,7	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ ... PA 143 DR (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
620	15,7-16,3	620	16,0	1100	14,7-15,0	600	0	100	6,6-8,1	800	15,8-16,0
				1150	8,0-13,0			200	5,7-7,7	1050	15,0-15,3
				1200	0 - 7,0			300	4,0-6,1		
				1250	0			400	1,3-3,8		
								500	0		

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control rod travel

630	15,7-16,3	630	16,0	1010	13,8-14,0	600	0	100	6,7-8,1	700	15,7-16,0
				1050	6,6-11,8			200	5,6-7,8	900	14,0-14,4
				1080	0 - 8,0			300	3,9-6,2		
				1140	0			400	1,3-3,7		
								500	0		

Torque-control travel on flyweight assembly dimension a = 0,6 mm

./.

The numbers denote the sequence of the tests

B. Governor Settings

RQV ...

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control					
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11				
ca. 68	1100	15,0-18,0	-	-	-	ca. 12	180	6,4-8,0	1100	0				
	1150	11,0-15,0					250	3,7-6,1			800	0,3-0,5		
	1200	6,6-11,8					350	1,9-3,3					500	0,5-0,7
	1280	0 - 6,2					490	0						
	1360	0												
2a	RQV...PA139DR (2)		Torque-control travel on flyweight assembly dimension a = 0,6 mm											

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ... rev/min	3a Fuel delivery characteristics		Starting fuel delivery 5 Idle		4a Idle stop	
rev/min 1	cm³/1000 strokes 2	3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	120 - 122	1130(RQV) 600(RQ)	600	122 - 126	100	18 - 20		
1000	203 - 205	1030(RQV) 600(RQ)	600	210 - 214	100	25 - 27		
When checking extend by ± 1 cm³ (col 2 and 5)!								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control					
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11				
ca. 68	1000	14,8-17,6	-	-	-	ca. 12	180	6,4-8,0	1000	0				
	1050	10,3-14,3					250	3,6-6,0			800	0,3-0,5		
	1100	5,2-10,7					350	1,8-3,4					500	0,6-0,8
	1150	0 - 6,6					500	0						
	1230	0												
2a	RQV... PA144DR (4)		Torque-control travel on flyweight assembly dimension a = 0,7 mm											

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ... rev/min	3a Fuel delivery characteristics		Starting fuel delivery 5 Idle		4a Idle stop	
rev/min 1	cm³/1000 strokes 2	3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/720 RS 87 RQ 250/1025 PA 54 DR
(V8449) (V8886D)

supersedes
company: FBW
engine: EDU-A N

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 13,2	0,5			
600	9	5,4 - 6,4				
600	12	11,4 - 12,7				
600	15	17,3 - 18,8				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		①		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 6		④		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		⑤		Torque control rev/min 11		Control rod travel mm 12		③	
980	13,1-13,7	980	13,4	1025	13,1-13,4	1050	8,0-12,2	1080	0 - 8,5	1140	0	550	0	150	6,7-8,1	250	4,9-7,1	350	1,9-4,4	450	0	450	15,8-16,6	700	14,6-14,9	900	13,4-13,8		

Torque-control travel on flyweight assembly dimension a = $0,8$ mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		②		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		③b		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		⑥	
ca. 10	mm RW																				

Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 8 P 110/920/4	LS 172	EP/RSV 350-1100 P1/310 R	(1)	supersedes
PE 8 P 110A920/4	LS 209			company: Scania
PE 8 P 110A920/4	LS 209	EP/RSV 350-1150 P1/371 R	(2)	engine: DS 14 (1-2)
PE 8 P 110A920/4	LS 251	EP/RSV 350-1150 P1/371 R	(3)	D 14 (3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 172, 209 cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery 251 cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,8-13,6	0,5	12	13,4-14,2	2,5±0,1* (max.2,2-2,9)
600	6	0,8- 1,8		6	1,3- 2,3	
600	12	12,2-13,7		12	12,7-14,0	
600	15	17,3-18,8		15	18,2-19,8	
200	6	0,6- 1,6		6	0,6- 1,6	

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

EP/RSV 350-1100 P 1 /310 R (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.67	1100	16,0	without auxiliary spring			ca.31	350	6,0	1080	0
	1150	11,7						100		
	1200	6,0	with auxiliary spring				350	5,7-6,3		
	1150	10,4-12,5						400	3,2-4,7	
	1200	4,4- 7,8						550	0 - 1	
	1350	0,3- 1,0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(1) 1100	162,0-164,0 (161,0-165,0) ** max.6	1115-1125	600	158,0-161,0 ** max. 6	100	190 - 240	(ca. RW 6)	(ca. RW 6)
(14 ± 0,5 mm RW)					225	9 - 13)* ** max. 2)		
** dispersion					1200	46 - 56) ** max.4)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

The numbers denote the sequence of the tests

350-1150 P1/371R (2-3)

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control	
			4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca.69	1150 1200 1240	16,0 11,6 7,1	without auxiliary spring			ca.31	350	6,0	screw in completely	
②a	1220 1260 1350	8,0-10,5 3,2- 6,5 0 - 1					with auxiliary spring			
			350	5,7-6,3						
			420	1,9-3,7						
			500	0 - 1						

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat. Note: changed to ...) rev/min 3	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop	
rev/min 1	cm³/1000 strokes 2		rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
(2) 1100 ** (14±0,5 mm RW)	162,0-164,0) max. 6)	1165-1175	600 **	158,0-161,0) max. 6)	100	190 - 240	*	(ca. RW 6)
					225	9 - 13) max. 2)		
					1230	46-56) max. 4)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

** dispersion

B. Governor Settings

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower: rated speed		③ Torque control	
			4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp. 40°C (104°F)		⑥ Rotational-speed limitat. Note: changed to ...) rev/min 3	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ ④a Idle stop	
rev/min 1	cm³/1000 strokes 2		rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
(3) 1100	117,0-119,0	1180-1190: 1 mm RW less than column 2	350	9 - 13) max. 2)	100	mind. 20	350	6,0
			1200	45 - 49) max. 4)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

En

PES 6 P 120/1320 RS 162 RQV 300-900 PA 117 R
300-800

supersedes
company: **Baudoin**
engine: **DPSR**

Note sleeve position - see WPP 001/4, suppl. 6

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,8 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	12	21,8-22,7	0,8			
	6 15	5,7- 6,9 30,3-32,7				
200	6	2,6- 3,6				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQV ... PA 117

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever mm 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a Degree of deflection of control lever mm ②a	rev/min 5	Control rod travel mm ④	③a Degree of deflection of control lever mm 7	rev/min 8	Control rod travel mm ③	rev/min 10	mm ① MW 11
ca. 68	900 950 1000 1070	15,0-17,8 7,6-12,8 0 - 7,5 0	-	-	-	ca. 12	200 350 500 630	7,2-8,2 3,8-6,1 1,5-3,0 0	200-290 400 700 1020-1080	Start 1,6-2,4 4,6-5,0 end 11

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b ④a	Fuel delivery characteristics high idle speed ⑤b ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel Control rod travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
ca. 10	mm RW - Carry out adjustment on engine	300-900 = 910 300-800 = 810 (VH ca. 63)						

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 120/420 LS 152 RQV 300-1050 PA 112 KR
sldg.-sleeve pos'n U/min mmRW

supersedes
company:
engine:

Allis Chalmers
Mark II

180-260	Start
400	1,8-2,7
550	3,8-4,2
1000	7,5-7,9
1200-1290	end (11)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	24,1 - 24,8	1,0			
600	6	6,7 - 7,9				
600	12	23,5 - 25,2				
600	15	30,6 - 32,6				
200	6	2,5 - 3,5				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1050 1100 1150 1210 1300	15,0-18,0 10,7-15,0 6,0-11,6 0 - 7 0	-	-	-	ca. 10	250 350 450 550	6,4-8,0 3,0-5,2 1,3-2,8 0	See	sect. C!

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed limitation intermediate speed 4a	Fuel delivery characteristics high idle speed 5b		Starting fuel delivery Idle switching point 6		Torque-control travel Control rod travel mm 5	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
1050	290 - 292	1070	900 700	298 - 302 294 - 300				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4
Edition 13.3.72

En

PE 6 P 110 A 320 RS 100 RQV 200-1100 PA 181/2 R

supersedes
company: Volvo
engine: THD 100

Port-closing test with/without ROBO diaphragm

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	17,4 - 18,2	0,7			2,5 ± 0,1* (max.2,2-2,9)
600	9	10,1 - 11,4				
600	12	16,7 - 18,2				
600	15	22,7 - 24,2				
200	9	7,6 - 8,6				

Adjust the fuel delivery from each outlet according to the values in
* In the case of greater dispersion after the delivery-valve spring pre-tension accordingly.

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca.68	1150	15,5-18,3	-	-	-	ca.23	100	7,0-10,0	-	-
	1410	0					200	5,0- 8,4		
ca.66	1100	15,0-18,0					300	2,4- 5,2		
	1200	7,2-12,6					400	0 - 2,2		
	1260	2,0- 9,0					460	0		
	1400	0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
0 kp/cm ² 700	110,5-116,5		1,9-2,0 kp/cm ² 700	175,5-181,5	100			
			1,0 kp/cm ² 700	162,5-166,5	225	15 - 19		
					dispersion.max.2,5			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

1. Basic adjustment (Sections A - B) without smoke limiter.

Set sliding-sleeve position 36.0 mm (refer also to WJP 211/31)

2. Stop adjustment (Attach smoke limiter and test at $n = 800$):

1st stage (outer spring - alter by way of shims beneath outer spring)

Start 0.19-0.27 kp/cm^2 (140-200 mmHg)

Difference 2.4 mm
control-rod travel

End 0.77-0.86 kp/cm^2 (570-630 mmHg)

2nd stage (outer and inner spring - alter by way of shims beneath inner spring)

Start 1.12-1.27 kp/cm^2 (830-940 mmHg)

End 1.43-1.63 kp/cm^2 (1070-1200 mmHg)

3. Setting full-load deliveries:

Set quantities injected at stop screw of bell crank at charge-air pressure 0 kp/cm^2 .

By pressing on diaphragm - connect up compressed air - move stop such that more control-rod travel is attained than that required for full-load delivery at maximum charge-air pressure.

Set injected quantity at stop screw in housing at charge-air pressure 2.0 kp/cm^2 .

Measure injected quantity at charge-air pressure 1.0; correct - if necessary - by adjusting retainer (guide bushing of springs).

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/821 LS 84
LS 93

RQ 175/1000 PA 51 DR

supersedes
company:
engine:

Enassa
9109
(240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,8 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 13,2	0,5			
600	9	5,4 - 6,4				
600	12	11,4 - 12,7				
600	15	17,5 - 18,8				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 5		rev/min 6		Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		rev/min 11		Control rod travel mm 12	
450	15,7-16,3	450	16,0	1000	13,8-14,2	400	0	100	6,0-8,0	600	15,7-16,0												
				1020	8,0-13,5			200	2,8-5,0	800	14,9-15,2												
				1050	0 - 8,5			250	0 -2,7														
				1100	0			300	0														

Torque-control travel on flyweight assembly dimension a = **0,7** mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		Control rod travel mm 8	
ca. 10	mm RW														

Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 110 A 320 RS 266 RQV..PA 173KR, 217KR,294KR

supersedes

company:

Allis Chalmers

engine:

see WPP 001/4, suppl. 3.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8+0,1$ mm (from BDC) (+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,0-16,8	0,7			
600	9	8,4- 9,6				
	12	15,1-16,6				
200	15	21,4-23,2				
	9	6,7- 8,0				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

300-1025 PA173 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min ②a	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③	rev/min 10	mm 11
ca.66	1100 1150 1200 1280 1360	14,8-17,6 10,6-14,7 6,0-11,4 0 - 5,6 0	-	-	-	ca.10	250 300 400 570	6,2-8,0 4,2-6,5 0,2-5,6 0	350 600 1000	1,8-3,0 3,9-4,4 7,0-7,4

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1015	89,0-91,0	1045-1055*	700	96,0-100,0	100 300	210 19 - 23		

Change-over point
150-250 U/min

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

ALO 8,5 b

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100	14,8-17,6	-	-	-	ca. 10	250	6,2-8,0	350	1,8-3,0
	1150	10,6-14,7					300	4,2-6,5	600	3,9-4,4
	1200	6,0-11,4					400	0,2-5,6	1000	7,0-7,4
	1280	0 - 5,6					570	0		
	1360	0								
						(3a)			-	-

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
990	120,0-122,0	1020-1030*	700	124,0-126,0	100	210		
					300	19 - 23		
					Change-over point 150-250 U/min			

Checking values in brackets

* 1 mm less control rod travel than col 2

300-1000 PA 294KR

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100	14,8-17,6	-	-	-	ca. 10	250	6,2-8,0	350	1,8-3,0
	1150	10,6-14,7					300	4,2-6,5	600	3,9-4,4
	1200	6,0-11,4					400	0,2-5,6	1000	7,0-7,4
	1280	0 - 5,6					570	0		
	1360	0								
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1000	1,1 bar 135,0-137,0	1045-1055*	LDA 500	1,1 bar 131,5-135,5	100	210		
			LDA 500	0 bar 75,5-83,5	300	19 - 23		
					Change-over point 150-250 U/min			

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

ALO 8,5 b

Test at n = **500** rev/min ^{decreasing} pressure - in bar gauge pressure
_{increasing}

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
	0,75-0,80 = 0,2 mm RW less than full load	0,19-0,26 = 2,3 mm RW less than full load	

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4
Edition 1.4.64

En

PE 6 P 120/300 S 12

PE 6 P 120/320 S 13

EP/RSUV 250-900 P 5/305

supersedes

company

engine

Marini
CB 12 TC

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,0 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	27,7-28,7	1,0			
600	6	6,8- 7,8				
600	12	24,8-26,8				
600	18	43,8-46,3				
200	6	4,2- 5,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11		
ca. 68	800	16	without auxiliary spring			ca. 27	250	8	780	0		
	820	11,7							50	23 - 25	400	0
	840	6,7	with auxiliary spring				250	7,7-8,3	290	1,2-1,8		
2a	850	4 - 6							300	3,3-5,4		
	880	0 - 3,2							350	0 - 2,2		
	930	0 - 1							400	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 4a Idle stop	
Test oil temp. 40°C (104°F)	rev/min 1	cm ³ /1000 strokes 2	Note: changed to) rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
	ca. 10,5	mm RW		910-920				250	8

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps ② and Governors

PE 4 P 120/720 LS 70 RQ 325/775 PA 41 R
 PE 4 P 120/300 LS 71
 1 - 2 - 4 - 3) S 70 1 - 3 - 4 - 2) S 71
 0 -90 -135-225 0 -45 -135-270

supersedes
 company: **Simmering-Oras-Pauker**
 engine: **S 108 B**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,8 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	12	19,3 - 19,8	0,8			
	9	12,0 - 13,3				
	15	23,8 - 25,5				
200	9	9,6 - 10,8				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control					
①		Setting point		Test specifications		④		Setting point		Test specifications		⑤		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12				
550	15,7-16,3	550	16,0	775	15,6-16,0	535	0	200	7,2-8,1	-	-				
				800	9,6-14,1			250	6,0-8,1						
				830	0 - 8,8			300	4,2-6,6						
				880	0			390	0 -2,6						
								435	0						

Torque-control travel on flyweight assembly dimension a = mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a	③b		⑥	
rev/min 1	cm ³ -1000 strokes 2	rev/min 3	rev/min 4	cm ³ -1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
ca.	10,5 mm RW					

Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

PE 6 P 100/420 RS 104
(V 8638)
RS 104 Z

RQV 250-1100 PA 63 DR
(V9124)

supersedes 6.10.67
company: Saurer
engine: D K

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4-13,2	0,5			
600	9	5,4- 6,4				
600	12	11,4-12,8				
600	15	17,3-19,0				
200	9	3,6- 4,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min 10	mm 11
ca. 66	1100 1160 1240 1310	15,0-18,2 8,6-13,8 0 - 6,8 0	-	-	-	ca. 10	200 300 400 600 740	6,1-8,0 3,5-4,9 2,8-3,8 0,8-2,1 0	1100 900 700 500	0 0,1-0,3 0,4-0,6 0,5-0,7

Torque control travel a = 0,6 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5b	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	104,5-107,5	1120	700	107,0-111,0				
1100	106,5-109,5	1120	700	109,0-113,0				
"Z"								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4
Edition 7.71

En

PE 6 P 120/320 RS 57

EP/RSUV 250-900 P 10/316 R

supersedes
company
engine

Breda
D 30 S 6

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	18,2-19,0				
600	9	8,1- 9,3				
600	12	17,0-18,4				
600	15	26,3-27,9				
200	9	6,1- 7,3				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control			
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9	10	11		
ca.67	900	16,0	without auxiliary spring			ca.25	250	8,0	880	0		
	920	12,0							100	19 - 21	375	0
	940	8,0	with auxiliary spring				250	7,7-8,3	290	1,2-1,8		
	940	6,0-9,4							275	6,0-7,0		
	950	4,7-7,4							320	1,4-4,5		
	975	1,3-4,2							390	0 -1,0		
2a	1020	0 -1,0										

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery idle		5		4a Idle stop	
Test oil temp 40°C (104°F)	rev/min	Note changed to rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
	1	2	3	4	5	6	7	8	9	
	880	ca.10,5 mmRW								

Checking values in brackets

* 1 mm less control rod travel than col 2

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H20

H20

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4
Edition 23.2.66

En

PE 8 P 120/520/5 RS 42 EP/RSUV 250-100Q PO/4 R

supersedes
company Kaelble
engine M 140

1 - 5 - 6 - 8 - 4 - 2 - 7 - 3
0 -45 -90 -135-180-225-270-315°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	27,7-28,7				
	6	6,6- 7,8				
	12	24,8-26,8				
200	15	36,3-38,8				
	6	4,2- 5,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 62	1000	16,0	without auxiliary spring			ca. 21	250	8	980	0
	1040	10,2					100	19 - 21		
	1060	6,4	250	7,7-8,3	300		1,2-1,8			
	1040	8,0-12,0	with auxiliary spring					350	1,5-4,5	
2a	1100	1,5- 4,5				550	0 - 1			
	1200	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limitat		3a Fuel delivery characteristics		Starting fuel delivery Idle		5		4a Idle stop	
Test oil temp 40°C (104°F)	rev/min 1	cm ³ /1000 strokes 2	Note changed to) rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9		
	ca. 10	5 mm RW	1010-1030								

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

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H21

H21

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4

23.6.69

En

PE 8 P 110/920 LS 34

EP/RSUV 250-750 P. 9/311 DR
250-900 P10/303 DR
(V 8225 D)

supersedes
company
engine

Henschel
8 V 1416 A

1 - 8 - 5 - 4 - 7 - 2 - 3 - 6 - 1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

0 -30 -90-120-180-210-270-300-360°

Port closing at prestroke

mm (from BDC)

2,0 + 0,1

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
600	12	19,0-19,8	0,8			
	6 15	6,7- 7,7 24,2-25,9				
200	6	4,7- 5,7				

Adjust the fuel delivery from each outlet according to the values in

Control lever = 35°

250 - 750 P 9/311 DR

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm	Control rod travel mm rev/min	Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control rev/min	Control rod travel mm
			4	5	6		rev/min	Control rod travel mm		
ca. 54	750	16	without auxiliary spring			ca. 20	250	7	730	0
	760	13					60	19 - 21		
2a	770	9	with auxiliary spring				250	6,7-7,3	450	1,6-1,8
	770	6,5-10,4					350	3,5-5,2		
	820	2,0- 3,3					520	0 - 1		
	900	0 - 1								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limit Note changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
ca. 10 mm RW		760						
- Carry out adjustment on engine		910						

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

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H22

H22

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Torque-control travel rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-900 P10/303 DR (V 8225 D)

Control lever - 35°

ca.61	900	16	without auxiliary spring	auxiliary	ca.22	250	7	880	0
	920	10,6				100	19 - 21		
	940	5,0				250	6,7-7,3		
	930	4,8-9,8	400			2,8-4,8			
	960	3,2-4,3	600			0 - 1			
	1060	0 - 1	with auxiliary spring			350	1,9-2,1		

Testoil-ISO 4113

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4

Edition 7.4.72

En

PE 8 P 120/501/5 LS 61
PE 8 P 120/520/4 LS 62 EP/RSUV 250-1000 P0/1001 R

supersedes
company Henschel
engine 15 V 1516 A

Pumps run in tandem

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke mm (from BDC) 2,0 + 0,1

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	23,0-23,4	0,8	Cam sequence and angular spacing:		
600	6	6,5- 7,5		S 61: 1-6-3-7-2-5-4-8 0-75-90-135-210-225-300-315°		
	12	20,3-21,8				
200	15	25,8-27,5		S 62: 1-8-3-6-2-7-4-5 0-75-90-165-210-225-300-315°		
	6	2,6- 3,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Control lever - 35°

1 Upper rated speed rev/min Degree of deflection of control lever	Control rod travel		Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control			
	mm	mm rev/min	4	5	6		rev/min	mm	rev/min	mm		
1	2	3	4	5	6	7	8	9	10	11		
ca. 70	1000	18	without auxiliary spring			ca. 16	250	8	980	0		
	1015	14,4							100	15 ... 21	300	0
	1030	7,4	with auxiliary spring				250	7,7...8,3	150	1,7...2,3		
	1030	5,4...11,8							300	4,3...6		
	1040	0,4... 8,2							375	1,6...4,7		
	1080	0 ... 1							410	0 ...1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limit Note: changed to .) rev/min		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
rev/min	cm ³ /1000 strokes	3	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	
Carry out adjustment on engine									
980	ca. 237	1030							

Checking values in brackets

* 1 mm less control rod travel than col 2

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H24

H 24

Test Specifications Fuel Injection Pumps ② and Governors

PE 6 P 120/420 RS 119 RQ 250/1100 PA 73 DR

Cam sequence 1 - 4 - 2 - 6 - 3 - 5
Angular cam spacing 60°

supersedes

company:

Saurer
DKT

engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	25,2-26,0				
600	6	4,4- 6,0				
600	12	19,3-21,1				
600	15	28,7-30,7				
200	9	3,0- 4,4				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Checking of slider FRG check rev/min 1		Control rod travel mm 2	Full-load speed regulation Setting point rev/min 3				Control rod travel mm 4	Test specifications rev/min 6				Control rod travel mm 5	Idle speed regulation Setting point rev/min 7		Control rod travel mm 8	Test specifications rev/min 9		Control rod travel mm 10	Torque control rev/min 11		Control rod travel mm 12				
550	15,6-16,4	550	16,0	1100	14,9-15,3	530	0	100	6,9-8,1	550	16,0	200	5,3-7,6	700	15,9-16,0	300	2,7-5,1	900	15,5-15,8	400	0 - 1,1	1100	14,9-15,3	430	0

Torque-control travel on flyweight assembly dimension a = 0,25 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2	Control rod stop rev/min 3	Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5	Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7	Control rod travel mm 8
		ca. 10,5 mmRW								

Checking values in brackets

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/720 RS 117 RQ250/1075 PA 71 DR
110/721 RQV250-1075PAV9485 D
RQV250-500/1075 PA171
RQV250-1075 PA 119D

supersedes 20.6.68
company:
engine: F B W
E 3

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8+0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,5-13,1	0,4	12	14,8-15,4	
600	9	5,3- 6,5		9	7,3- 8,5	
600	12	11,3-12,8		12	14,1-15,7	
600	15	17,3-18,9		15	20,7-22,7	
200	9	3,6- 4,6		9	5,5- 6,5	

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ...PA 71 DR

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1000	13-13,8	1000	15,4	1075	13,1-13,4	550	0	100	7,0-8,1	450	15,8-16,7
				1100	7,0-12,0			250	4,8-6,9	600	15,1-15,4
				1130	0 - 8,3			350	1,9-4,2	900	13,4-13,7
				1180	0			450	0		

Torque-control travel on flyweight assembly dimension a = 0,8 mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
	ca. 10 mm RW					

Checking values in brackets

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-1075 PAV 9485D

* a = 0,5 mm

ca.66	1075	16,0-18,0	-	-	-	ca.10	200	6,5-8,0	1075	0	
	1150	7,0-12,0					300	3,3-4,4		800	0,4-0,6
	1200	2,0- 8,0					450	2,0-3,4		600	0,4-0,6
	1280	0					680	0			

250-500/1075 PA 171

ca.66	1100	11,4-14,6	ca.54	550	7,3-14,5	ca.10	100	6,4-8,0	-	-
	1150	5,7-10,8		650	2,5- 3,5		200	5,1-7,3		
	1200	0 - 6,7		1050	2,5- 3,5		300	3,1-5,4		
	1280	0		1160	0		470	0		

250-1075 PA 119D

* a = 1,5 mm

ca.66	1075	15,0-17,6	-	-	-	ca.10	100	7 - 8	1075	0		
	1120	9,8-14,4					250	3,6-5,9			500	1,4-1,6
							400	2,4-3,8				
							550	0,9-2,3				
				690	0							

* Torque-control travel

--	--	--	--	--	--	--	--	--	--	--

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4

BOS 12,3 a
Edition 6.68

En

PE 6 A 100 C 310 LS 3002 RQ 250/1100 AB 659 DL
(V 9180 D)
RQV250-1100 AB 664 DL

supersedes
company: **Büsing**
engine: **U 12 D**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke **2,3 + 0,1** mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	7,5 - 8,3	0,4			
	6 12	3,2 - 4,2 12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ ... AB 659 DL

Checking of slider PRG check ①		Full-load speed regulation Setting point ①				Idle speed regulation Setting point ④				Torque control ③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1050	14,9-15,2	1050	15,2	1120	14,8-15,2	520	0	100	7,0-8,1	450	15,8-16,5
Breakaway not before n = 1120				1150	10,0-14,0			200	5,8-7,9	600	15,5-15,8
				1200	0 - 8,5			300	3,1-5,4	750	15,2-15,4
				1270	0			420	0		

Torque-control travel on flyweight assembly dimension a = **0,25** mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes/mm 7
1100	126,5-129,5	500	800	124,0-128,0	100	ca. 18 mm RW
			600	119,5-123,5		

Checking values in brackets

./.

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100 1150 1200 1310	15,0-18,0 10,0-14,3 4,0-10,0 0	-	-	-	ca. 10	200 300 500 600 710	6,4-8,0 3,2-5,2 2,1-3,8 0,6-1,8 0	1100 800 600	0 0,2-0,4 0,3-0,5

Torque control travel a 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	125,5-128,5	1120	500 700	119,0-123,0 126,5-130,5	100	18 - 19		To be specified by customer

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm

En

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4
BOS 11,4 a
Edition 10.66

En

PE 6 A 100 C 312 LS 3002 RQ 250/1050 AB 582 DL
LS 3002 Z
LS 3002 Y
LS 3002 RQV 250-600/1050 AB 597DL
AB 611DL

supersedes
company: Büssing
engine: U 11 D - 210 P
"Z" - 185 P
"Y" - 195 P

See BMP 111/35 - EP

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	7,5 - 8,3	0,4			
	6 12	3,2 - 4,2 12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation Setting point ①				Idle speed regulation Setting point ①				Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1000	14,6-15,4	1000	15,0	1070 1100 1140 1180	14,8-15,0 7,0-13,0 0 - 7 0	520	0	150 250 350 420	6,5-8,1 4,5-6,5 1,0-3,4 0	650 700	15,6-16,0 15,0-15,4

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes/mm Control rod travel
1	2	3	4	5	6	7
1050	121,0 - 124,0	500	600 500	116,0- 120,0 112,0- 116,0	100	ca. 18mm RW

Checking values in brackets

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
66±1,5	1050	15,0-18,0	54±1,5	580	14,7-15,3	10±1,5	150	6,2-8,0	600	0
	1100	7,3-13,0		650	6,0-14,0		250	5,0-7,3		
	1150	0 - 7		750	2,5- 3,5		400	2,0-4,5		
	1210	0		1050	2,5- 3,5		550	0		
				1110	0				350	0,3-0,5

Torque control travel a = 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1050	103,5-106,5	500	600	101,5-105,5	100	ca.18mmRW	To be specified by customer (→ AB 611 DL)	
1050	114,0-117,0	500	500	94,5- 98,5				
1050	118,5-121,5	1060-1080	600	106,5-110,5				
			500	101,5-105,5				
			600	110,0-114,0				
			500	106,5-110,5				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col 2

②

Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP/ 001/4 BOS 11,4 b
Edition 6.68

En

PE 6 A 100 C 410 RS 3004 RQ 250/1050 AB 636 DL
412 RQV250/600/1050AB670DL ./.

supersedes

company: Büssing

engine: S 11 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,3 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	7,5 - 8,3	0,4			
	6 12	3,2 - 4,2 12,4 - 13,4				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ .. AB 636 DL

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Control rod travel mm 8	Control rod travel mm 9	Control rod travel mm 10	Control rod travel mm 12				
14,9-15,5	15,2	1070	14,8-15,2	520	0	100	7,1 - 8,1	400	15,8-16,5		
Breakaway not before n = 1070		1100	7,0-13,2			200	5,6 - 7,7	500	15,4-15,7		
		1130	0 - 9,0			300	2,9 - 5,2		15,2-15,3		
		1180	0			420	0				

Torque-control travel
on flyweight assembly dimension a = 0,25 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3	Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm ³ /-1000 strokes 2	Control rod travel mm 3a	Control rod travel mm 3b	cm ³ /-1000 strokes 5	Control rod travel mm 6	Control rod travel mm 7	Control rod travel mm 6
1050	124,5 - 127,5	500	700 500	122,5 - 126,5 118,5 - 122,5	100	ca. 18 mm RW

Checking values in brackets

Testoil-ISO 4113

BOSCH

Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung.
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B. Governor Settings

RQV .. AB 670 DL

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
66±1,5	1050	15,0-18,0	54±1,5	580	14,7-15,3	10±1,5	150	6,2-8,0	600	0
	1100	7,3-13,0		650	6,0-14,0		250	5,0-7,3		
	1150	0 - 7		750	2,5- 3,5		400	2,0-4,5		
	1210	0		1050	2,5- 3,5		550	0		
				1110	0				350	0,3-0,5

Torque control travel a 0,4 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristic: high idle speed		Starting fuel delivery idle switching point	Torque-control travel		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1050	124,5-127,5	1070	700	121,0-125,0	100	18 - 18,5	To be specified by customer	
			500	119,0-123,0		mm RW		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm

En

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

En

PES 6 A 100 C 320 RS 3010 RQV 300-1125 AB693 D (1) **supersedes** 6.69
 300-1275 (2) **company:** Daimler Benz
 RS 3010 RQV ...ABV10577D,10823D (1,2) **engine:** OM 360 H
 PES 6 A 90 C 320 RS 2272 RQV 300-1125 AB693D (3)

Switch-over point is where the automatic control rod stop locks and unlocks.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5+0,1(3010) mm (from BDC) 3,0 + 0,1 (2272)

Rotational speed rev/min	Control rod travel mm	Fuel delivery 3010 cm ³ /100 strokes	Difference cm ³ / 100 strokes	Control rod travel mm	Fuel delivery 2272 cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	5
1000	9	7,6 - 8,2	0,4	9	7,4 - 7,9	
	6 15	2,2 - 3,2 18,2 - 19,4		6 15	2,9 - 3,7 16,0 - 17,3	
200	9	5,0 - 6,0		6	1,5 - 2,5	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

300-1125 AB 693 D (1,3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1125 1150 1200 1250 1300 1400	15 - 17,7 13,1-16,3 9,0-13,5 4,7-10,3 0 - 7,1 0	-	-	-	ca.10	100 200 300 400 600 630	7,5-8,0 6,2-7,9 5,0-6,8 3,0-5,1 0 - 1,1 0		

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(S 3010 1) 1100	95,5 - 98,5	1150: 0,5-1,0mm RW less than column 2	500	93,0-96,0	100	14,7-15,3		
Adjusting the minimum rated speed							Change-over point 250-200 U/min / 200-150 U/min /	300 - 250 -

Checking values in brackets:

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQV..

1	Upper rated speed rev/min		Intermediate rated speed			4	Lower rated speed		3		
	Degree of deflection of control lever	Control rod travel mm	Control rod travel mm	rev/min			rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
(1)	ca.66	1125	15 - 17,6	-	-	-	ca.10	100	5,6-7,6	-	-
		1150	13 - 16,5					200	4,6-6,6		
		1200	9,4- 13,8					300	2,9-4,9		
		1250	5,2- 10,8					400	1,8-3,1		
		1300	0,8- 7,6					525	0-1,2		
(2)	2a	1420	0				580	0			
		1275	15,0-17,6				ca.10	150	6,7-8,0		
		1350	9,8-14,1				250	5,7-7,4			

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
rev/min	cm³/1000 strokes		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1250	96,0 - 99,0	1300:0,5-1,0 mm ***	500	max. 96,0	100	14,7-15,3		
Change-over point 250-200 U/min / 300 - 200-150 U/min / 250 - Adjusting the minimum rated speed								

Checking values in brackets

* 1 mm less control rod travel than col. 2

** Torque-control travel a = 0

*** less than column 2

Testoil-ISO 4113

B. Governor Settings

1	Upper rated speed rev/min		Intermediate rated speed			4	Lower rated speed		3		
	Degree of deflection of control lever	Control rod travel mm	Control rod travel mm	rev/min			rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
(2)	ca.66	1400	6,0 -11,5				ca.10	350	4,3-5,9		
		1480	0 - 7,0					500	1,0-3,5		
		1590	0					640	0		
		1275	15,0 -18,4					100	6,5-8,0		
		1350	10,0 -14,7					250	4,7-6,8		
2a		1420	4,6 -10,7				350	2,7-4,8			
		1500	0 - 6				450	1,6-3,1			
		1600	0				600	0			

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit	3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
rev/min	cm³/1000 strokes		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	92,5 - 94,5	1150:0,5-1,0 mmRW ***	500	93,0-96,0	100	14,7-15,3		
Change-over point 250-200 U/min								

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ② and Governors

En

PES 6 P 100 A 420 RS 262 RQ 300/1100 PA 219 DR
RQV250-1100 PA 139 DR

supersedes
company: Saurer
engine: D 2 K
(240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 13,2	0,4			
600	9	5,2 - 6,6				
600	15	17,1 - 19,1				
200	9	3,5 - 4,7				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ 300/1100 PA 219 DR

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12	
650	15,7-16,3	650	16	1120	15,1-15,4	600	0	180	6,3-8,1	770	15,8-16,0										
Speed regulation less control-rod travel at 1150-1170 min/1		1±0,5 mm		1160	8,7-13,7			250	5,3-7,3	950	15,4-15,6										
				1200	0 - 9			350	3,1-5,3												
				1270	0			500	0												

Torque-control travel on flyweight assembly dimension a = 0,2 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		Control rod travel mm 8	
1100	120,0-122,0			500	700	126,0-130,0									
					500	114,5-119,5	100	16 - 18							

Checking values in brackets

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100 1150 1200 1280 1360	15,0-18,0 11,0-15,0 6,6-11,8 0 - 6,2 0	-	-	-	ca. 12	180 250 350 490	6,4-8,0 3,7-6,1 1,9-3,3 0	1100 800 500	0 0,3-0,5 0,5-0,7

Torque control travel a = 0,6mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 110 A 820 LS 255 RQV 225-1100 PA206 R (1)
225-1250 (2)
RQ 225/1250 PA207 R (3)

supersedes
company: Fiat
engine: 8200.12,

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	16,3 - 17,1	0,5			
600	9	8,9 - 10,3				
600	12	15,1 - 16,8				
600	15	21,5 - 23,5				
200	9	7,2 - 8,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQV 225-1100 PA206 (1)

Upper rated speed				Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	1a	4	5	6	7	8	9	10	11
ca. 66	1100	14,8-17,8	-	-	-	-	ca. 10	150	6,6-8,0	1100	8,2
	1150	9,8-14,2						250	5,0-6,8		
	1220	2,0- 8,6						350	2,9-4,1		
	1310	0						500	1,8-3,1		
							3a	710	0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	106 - 108	1120			100	21 - 23		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQV 225-1250 PA 206 (2)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1250 1270 1340 1430	14,8-17,8 6,0-11,4 0 - 6,2 0	-	-	-	ca. 10	120 200 320 500 790	6,5-8,0 5,5-7,2 2,8-4,4 1,8-3,5 0	1250	8,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1250	112 - 114	1270			100	21 - 23		

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

RQ 225/1250 PA 207 (3)

Checking of slider PRG check ①		Full load speed regulation Setting point ②				Idle speed regulation Setting point ④				Torque control ③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
550	15,7-16,3	550	16,0	1270 1300 1350 1400	15,6-16,0 9,5-15 0 - 8,2 0	510	0	100 200 300 410	6,3-8,1 4,7-6,8 2,1-4,3 0	-	-

Torque-control travel on flyweight assembly dimension a

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
1240	106 - 108	1250			100	21 - 23

When checking extend by ± 1 cm³ (Sect. C, col. 4 and 5)!

En Checking values in brackets

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4
1. Edition

En

PE 6 P 110 A 321 RS323 EP/RSV 300-1200 P 2/408R

supersedes
company Berliet
engine MIS 620 x 30

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC) (+ 0,15
- 0,05)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12					
200	9					

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Intermediate rated speed			4 Control-lever deflection in degrees	Lower rated speed		3 Torque control	
			4	5	6		rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1150	16,0	without auxiliary spring			ca. 21	300	4,8	1200	0
	1250	10,8								
	1320	6,2	with auxiliary spring				150	19 - 21		
2a	1200	12,2								
	1300	6,8								
	1480	0,3-1,0					500	0,7-2,8		
				650	0 - 1					

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp 40°C (104°F)		6 Rotational-speed limit Note: changed to) rev/min	3a Fuel delivery characteristics		Starting fuel delivery idle		5		4a Idle stop	
rev/min	cm ³ /1000 strokes		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm		
1	2	3	4	5	6	7	8	9		
LDA 1200	0,6 bar 122,0-124,0	1260-1270*	LDA 350	0 bar 91,5-95,5	100	110-140				

Checking values in brackets

* 1 mm less control rod travel than col 2

2.77

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
323 with 408R	0,34-0,37	0,20-0,25	-0,2 -0,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

DAI 20,1 f
Edition 10.69

En

PE 6 P 120/320 RS 28 EP/RSUV 250/800P 5/309 R
RS 36 225-800P 5/309 R,310R
225-600P 3/309 R*
225-500P 2/309 R**

supersedes 8.66
company Daimler-Benz
engine MB 846 A
MB 846 Ab ./.

Governors: basic setting 35°
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2		Fuel delivery S 28 cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery S 36 cm ³ /100 strokes 3		Spring pre-tensioning (torque-control valve) mm 6
	②							
600	12		17,4 - 18,1	0,8	600	6		9,3-10,8
	6 15		6,5 - 7,5 24,3 - 26,3			9 15		
200	6		2,1 - 2,9	200	6	3,2- 4,2		

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

EP/RSUV

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2		Intermediate rated speed 4 5 6			④ Control-lever deflection in degrees 7	Lower rated speed rev/min 8 9		③ Torque control rev/min 10	Control rod travel mm 11
	Control rod travel mm 3	Control rod travel mm rev/min 3					rev/min 8	Control rod travel mm 9		
250-800 ca.57 ②a	800	16,0	* without auxiliary spring			ca.16	250	6	780	0
	810	11,8					50	19 - 21		
	820	7,6	* with auxiliary spring			ca.16	250	5,7-6,3	250	1,2 - 1,8
	820	5,4-9,6					280	2,7-4,2		
	840	1,6-3,4					350	0 - 1		
	880	0 - 1								

225-800 ca.57	800	16	*	ca.16	225	6	780	0
	810	11,8			50	19 - 21		
	820	6,8			225	5,7-6,3		
	820	4,6-9,4			250	3,7-4,8		
	840	1,6-3,2			300	0 - 1,7		
900	1,6-3,2	350	0 - 1	250	1,2 - 1,8			
225-600* ca.68	600	16,0	*	ca.24	225	6	580	0
	610	10,5			50	19 - 21		
	620	4,8			225	5,7-6,3		
	610	9 - 12			250	1,0-3,0		
	620	3 - 7			280	0 - 1		
	650	0 - 1						

BOSCH

Geschäftsbereich KH Kundendienst Kfz-Ausrüstung
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B. Governor Settings

225-500**

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control			
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11		
ca.68	500	16,0	without auxiliary spring			ca.28	225	6	480	0		
	510	9,0							50	19 - 21	280	0
	515	5,6	with auxiliary spring				225	5,7-6,3	240	1,2-1,8		
	510	8 - 11							240	2,0-4,0	240	
②a	520	2 - 4							260	0 - 1		
	540	0 - 1										

Section C: Settings for fuel-injection pump with governor

MB 846 A

Column 1	2	3	4	5	6
Engine/pump speed min ⁻¹	Engine output	Test-oil temp.	Full-load delivery	Speed limitation U/min	
1500/750	225	20	730	190 - 193	760
		40		188 - 191	
1500/750	250	20	730	238 - 241	760
		40		235 - 238	
1600/800	240	20	780	211 - 214	810
		40		209 - 212	
1600/800	265	20	780	242 - 245	810
		40		239 - 242	
1200/600	205	20	580	220 - 224	610*
		40		218 - 222	
1000/500	170	20	480	227 - 231	510**
		40		224 - 229	
MB 846 Ab (pressure-charged)					
1500/750	300	20	730	258 - 261	760
		40		255 - 258	
1600/800	320	20		264 - 268	810
		40		261 - 265	
1600/800	350	20	780	278 - 282	810
		40		274 - 278	
1200/600	270	20	580	264 - 268	610*
		40		261 - 265	
1000/500	225	20	480	272 - 276	510**
		40		269 - 273	

Testoil-ISO 4113

Engine speed (Column 1) and engine output (Column 2) can be seen from engine nameplate; the data can be taken accordingly from Columns 4...6 and set on the test bench.

En

Test Specifications Fuel Injection Pumps ② and Governors

PE 5 A 100 C 312 LS 3014 RQ 300/1100 AB772D (1)
 PE 5 P 110 / 721 LS 213 RQ 250/1100 PA179D (2)*
 (A) RQ 300/1100 PA179D (3)*

supersedes 12.71
 company: U 10 D 5
 engine: (176 PS - 1)
 (192 PS - 2,3)

Cam sequence and angular spacing: 1 - 3 - 5 - 4 - 2 je 72°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,5 + 0,1$ mm (from BDC) -PE 5 A
 $2,8 + 0,1$ mm (from BDC) -PE 5 P

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery S 3014 cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery S 213 cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	7,8 - 8,6	0,4	12	10,8 - 11,6	
	6 12	3,5 - 4,5 12,6 - 13,7				
200	9	4,0 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ .. 772 (1)

Checking of slider PRG check rev/min 1		Control rod travel mm 2		①		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 5		④		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		⑤		Torque control rev/min 11		Control rod travel mm 12		③	
650	15,7-16,3	650	16,0	1115	15,5-16,0	580	0	200	7,0-8,1	-	-																		
				1160	7,8-13,1			300	5,0-7,0																				
				1200	0 - 9			400	1,6-4,0																				
				1280	0			480	0																				

Torque-control travel on flyweight assembly dimension a = 0 mm Speed regulation: At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		②		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		③b		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		⑥	
1100	117,0-119,0 (116,0-120,0)	500	500	100,0-104,0 (99,0-105,0)	100	ca.17 mm RW															

Checking values in brackets

11.73

Testoil-ISO 4113

RQ 250/1199 PA179D (2)*

B. Governor Settings

2

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
500	15,7-16,3	500	16,0	1120	15,6-16,0	480	0	150	6,7-8,1	-	-
				1150	10,0-14,0			250	4,2-6,3		
				1200	0 - 7,5			350	0 -2,3		
				1260	0				0		

Torque-control travel on flyweight assembly dimension a = 0 mm Speed regulation At 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery idle speed	
②		③a		③b		⑥	
rev/min	cm ³ /-1000 strokes	rev/min		rev/min	cm ³ /- 1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3		4	5	6	7
1100	119,5-121,5					100	17 - 19

Checking values in brackets

Testoil-ISO 4113

B. Governor Settings

RQ 300/1100 PA 179D (3)*

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12
600	15,7-16,3	600	16,0	1120	15,6-16,0	550	0	200	7,0-8,1	-	-
				1150	10,0-14,5			300	4,4-6,8		
				1200	0 - 8,3			400	0 -2,7		
				1260	0			450	0		

Torque-control travel on flyweight assembly dimension a = 0 mm Speed regulation At 1 mm less control rod travel

* When performing repairs, and in the event of idle problems, the idle springs - Item (2) - are to be changed from 1 424 617 016

to ... 018

and 2 shims in each case 1 200 102 624 are to be placed

beneath the idle springs

(at the same time changing nameplate to 300/1100)

- Item (3) - and both are to be adjusted in accordance with Item (3)!

Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 MB 16,0 a
3. Edition

En

PE 10 P 100/520/5 LS 800 RQ 300/1275 PA 100 DR
 PE 10 P 100 A 520/5 LS 806 RQ 300/1250 PA 172 DR
 320 RQ 300/1250 PA 187 R
 RQV300-1250 PA 172 DR
 10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 (+0,5)
 0 -45 -72 -117-144-189-216-261-288-333-360° (-0,75)

supersedes 4.73
 company: Daimler-Benz
 engine: OM 403

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC) - Cyl. 10 $(+ 0,1)$
 $(- 0,05)$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	8,1 - 8,8	0,4			
600	9	2,7 - 3,7				
600	12	6,3 - 7,5				
600	15	10,9 - 12,4				
200	9	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ..PA 100 DR

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 5		rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12	
600	15,7-16,3	600	16,0	1270	15,6-16,0	570	0	150	6,8-8,1	-	-												
				1300	11,0-15,0			250	5,1-7,2														
				1340	0 - 10,0			350	2,3-5,7														
				1410	0			470	0														

Torque-control travel on flyweight assembly dimension a = 0 mm
 Speed regulation: At $1290-1310$: 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		Starting fuel delivery Idle speed rev/min 6		Control rod travel cm ³ /1000 strokes/mm 7	
1250	94,0 - 96,0 (93,0 - 97,0)	600	600	600	75,0 - 80,0	100	14 - 16						

Checking values in brackets

5.74

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1250 1300 1330 1410	15,0-18,2 8,0-13,0 0 - 7,3 0	-	-	-	ca. 12	150 300 400 710	6,5-8,1 3,9-6,0 1,9-3,5 0	400 800 1200	2,1-3,0 4,4-5,0 8,2

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1250	94,0-96,0	1290-1310*	600 1340	74,0-79,0 11 - 21) dispersion max. 6)	100	14 - 16		
					Change-over point 250-180 U/min			

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

RQ..PA 187 R

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel		Setting point		Test specifications		Setting point		Test specifications		Control rod travel	
rev/min	mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
600	15,7-16,3	600	16,0	1270 1300 1330 1380	15,6-16,0 7,5-13,0 0 - 9,2 0	540	0	200 300 400 440	6,9-8,1 4,2-6,5 0 -2,4 0	-	-

Torque-control travel on flyweight assembly dimension a mm

Speed regulation At 1290-1310; 1 ± 0,1

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104 F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm ³ /-1000 strokes	rev/min	rev/min	cm ³ /-1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3	4	5	6	7
See page 1						

En Checking values in brackets

Test Specifications Fuel Injection Pumps ① and Governors

PE 6 P 100/720 RS 31, Z RQV250-1100 PA 19 R
PE 6 P 100/720 RS 31,Z,Y,X,V RQV...PA 19R, 33R,35R
Manifold-pressure compensator, see page 2,
reduced speeds and full-load deliveries, pages 3-4.

supersedes 6.67
company: Scania Vabis
engine: DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

S31,Z,X=2,6+0,1
S31,Y,V=2,4+0,1

Port closing at prestroke mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,6 - 14,2	0,6			3,5± 0,1* (max.3,2-3,9)
600	9	6,3 - 7,3				
200	12	12,3 - 13,5				
	6	0,6 - 1,2				
	9	4,1 - 5,2				

Testoil-ISO 4113

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed				Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11	
68±1,5	1150	15,0-18,2	-	-	-	10±1,5	200	5,8-8,0	-	-	
	1380	0 - 1,5					300	3,1-4,4			
62±1,5	1100	15,0-17,8					600	2,6-3,6			
	1150	10,2-13,8					500	1,8-3,0			
	1200	5,0-10,0					600	0,8-2,0			
	1250	0 - 5,6					780	0			
	1320	0									

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
**	0,5 bar		**	0,5 bar	100	24 - 29		
1080	144,5-147,5	1110-1130	600	139 - 143**	**	13 - 17*		
			**	0 bar	225	dispersion max. 1,5		
			500	122 - 130	**2	15-5,5cm ³ less than column 2		

Checking values in brackets

* 1 mm less control rod travel than col. 2

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Test oil temp 40°C (104°F)		Rotational-speed limitation	RQV	Fuel delivery characteristics		Starting fuel delivery	
Control-rod stop	RO	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	
1	2	3	4	5	6	7	

* 0,5 bar				* 0,5 bar	100	24 - 29
1080	135,0-137,0	1120	600	124,0-128,0		
				* 0 bar		
* charge-air pressure			500	106,0-114,0		

Pay particular attention to the following:

Basic adjustment of manifold-pressure compensator:

Horizontal position of cam (= without charge-air pressure) of full-load stop is to be set by way of stop screw in top of diaphragm housing.

Check:

- S31 : Correct difference in control-rod travel between pressure-charging (0.5 atg or 350 mmHg) and induction (0 atg) = 0.8 ± 0.02 mm by means of headless setscrew on bottom of diaphragm housing.
- S31 Z : As S31 however difference in control-rod travel = 0.9 mm.

Stop adjustment:

- S31 : The full-load control-rod travel (approx. 12.5 mm) must have decreased by 0.1 mm at 0.29 - 0.31 atg (212 - 227 mmHg) and 500 min⁻¹.
- S31 Z : The full-load control-rod travel (approx. 12.0 mm) must have decreased by 0.1 mm at 0.21 - 0.24 atg (157 - 180 mmHg) and 500 min⁻¹.
- S31 : The full-load control-rod travel must have decreased by 0.7 mm at 0.22 - 0.25 atg (165 - 187 mmHg) and 500 min⁻¹.
- S31 Z : The full-load control-rod travel must have decreased by 0.8 mm at 0.14 - 0.18 atg (102-134 mmHg) and 500 min⁻¹.

If these values are not attained, shims (as per service parts list) must be placed beneath the stop spring.

Full-load setting for pump ..S 31 Z with RQV 250 - 1100 PA 19 R:
(see Page 1 for control values and basic setting; refer to text above for adjustment of manifold-pressure compensator).

Full load setting see page 4!

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
250 - 700			-			10±1,5			-	
68±1,5	800	14,0-17,0	-	-	-	10±1,5	180	6,4-8,0	-	-
63±1,5	950	0 - 1,5					250	4,2-7,0		
	700	15,0-17,6					320	2,6-3,8		
	750	7,5-13,0					400	1,5-2,9		
	800	0 - 8,0					520	0		
	870	0								
250 - 750			-			10±1,5			-	
68±1,5	800	14,0-17,0	-	-	-	10±1,5	180	6,4-8,0	-	-
66±1,5	950	0 - 1,5					250	4,2-6,5		
	750	15,0-18,0					320	2,4-3,8		
	800	7,5-13,0					400	1,4-2,8		
	850	0 - 7,0					520	0		
	900	0								
250 - 800			-			10±1,5			-	
67±1,5	900	15,0-18,0	-	-	-	10±1,5	180	6,4-8,0	-	-
63±1,5	1080	0 - 1,5					250	4,2-6,5		
	800	15,0-17,6					320	2,3-3,8		
	850	10,0-14,0					450	1,0-2,3		
	900	4,0-10,0					580	0		
	1010	0								
250 - 850			-			10±1,5			-	
67±1,5	900	15,0-18,0	-	-	-	10±1,5	180	6,5-8,0	-	-
65±1,5	1080	0 - 1,5					250	4,4-6,5		
	850	15,0-18,0					320	2,2-3,8		
	900	9,0-14,0					450	1,0-2,3		
	950	1,0-10,0					570	0		
	1040	0								
250 - 900			-			10±1,5			-	
68±1,5	1000	15,0-18,2	-	-	-	10±1,5	180	6,0-8,0	-	-
64±1,5	1200	0 - 1,5					250	4,0-6,2		
	900	15,0-18,0					320	2,5-3,8		
	980	7,0-12,0					450	1,5-2,7		
	1050	0 - 6,4					630	0		
	1120	0								
375 - 900			-			18±1,5			-	
68±1,5	950	15,0-18,2	-	-	-	18±1,5	280	10,4-12,0	-	-
66±1,5	1160	0 - 1,5					350	6,4- 9,2		
	900	15,0-18,0					450	2,2- 3,5		
	950	10,0-14,0					550	1,0- 2,0		
	1000	4,5-10,0					660	0		
	1120	0								
250 - 950			-			10±1,5			-	
68±1,5	1000	15,0-18,2	-	-	-	10±1,5	180	6,3-8,0	-	-
66±1,5	1200	0 - 1,5					250	4,3-6,5		
	950	15,0-18,0					320	2,5-3,8		
	1000	10,0-14,0					450	1,4-3,0		
	1050	3,0-10,0					630	0		
	1150	0								

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
68±1,5	1150	15,0-18,2	-	-	-	10±1,5	180	6,4-8,0	-	-
	1360	0 - 1,5					250	4,3-6,5		
63±1,5	1000	15,0-18,0					320	2,8-3,8		
	1080	8,0-13,0					500	1,6-2,9		
	1150	1,6- 8,6					720	0		
	1270	0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
600	140 - 142	Upper rated speed 200/min						
600	125 - 127							
600	158 - 160							
600	145 - 147							
600	151 - 153							

Checking values in brackets

* 1 mm less control rod travel than col 2

- 1. 250 - 1050
- 2. 350/700 - 810
- 3. 350/820 - 950
- 4. 350/750/900

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
1. 68±1,5	1150	15,0-18,2	-	-	-	10±1,5	180	6,4-8,0	-	-
	1360	0 - 1,5					250	4,3-6,5		
64±1,5	1050	15,0-17,6					320	2,8-3,8		
	1120	9,0-13,3					500	1,5-4,0		
	1200	0,5- 7,8					720	0		
	1300	0								
2. 68±1,5	810	15,0-19,0	45±1,5	650	14,5-15,5	10±1,5	300	6,4-8,0	-	-
	825	8,0-14,0		700	9,0-15,0		350	3,8-6,3		
	840	0 - 8,0		725	5,0-10,0		400	3,6-4,0		
	865	0		750	1,0- 4,5		650	3,6-4,0		
				770	0		735	0		
3. 68±1,5	950	15,0-19,0	45±1,5	760	14,5-15,5	10±1,5	300	6,6-8,0		
	970	6,5-13,5		825	8,0-14,0		350	3,8-6,4		
	990	0 - 8,0		850	5,0- 9,5		400	3,6-4,0		
	1020	0		875	1,5- 5,0		750	3,6-4,0		
				900	0		860	0		
4. 66±1,5	900	15,0-19,0	55±1,5	700	14,5-15,5	10±1,5	300	7,0-8,0		
	920	7,0-14,0		760	13,0-15,5		350	5,0-7,4		
	940	0 - 9,0		800	6,6- 9,2		420	3,6-4,0		
	970	0		850	0		650	3,6-4,0		
							760	0		

En

②

Test Specifications Fuel Injection Pumps and Governors

40

WPP 001/4 KHD 11,3 b

1. Edition

En

Testoil-ISO 4113

PE 8 A 85 D 410 LS 2418 RQ 250/1200 AB 867DL
300/1200
RQV 300-1200 AB 915DL

supersedes -
company K H D
engine F 8 L 413 W
(180 PS)

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 .ie 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1 mm (from BDC) max. RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,0 - 5,5	0,4			
	6	1,3 - 2,1				
200	6	0,1 - 0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ 250/1200 AB867DL
300/1200

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control			
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications rev/min 5		Control rod travel mm 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9		Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	1240	13,0-13,4	550	0	150	6,4-8,1	1000	15,8-16,0	750	13,4-13,7
				1270	6,5-12,0			300	3,4-5,7				
				1300	0,5-9,0			400	0 -1,5				
				1370	0			450	0				

Torque-control travel on flyweight assembly dimension a = 0,8 mm Speed regulation A₁ 1240 - 1250 = 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000strokes 7
1200	67,5 - 69,5	600	1000 800	67,0 - 70,0 74,5 - 77,5	100	ca. 15 mm RW
						./.

Checking values in brackets

9.75

BOSCH

Geschäftsbereich KH Kundendienst, Kfz-Ausrüstung
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K17

Test Specifications Fuel Injection Pumps and Governors

WPP 001/4 KHD 11,3 b

1. Edition

En

Testoil-ISO 4113

PE 8 A 85 D 410 LS 2418 RQ 250/1200 AB 867DL
300/1200
RQV 300-1200 AB 915DL

supersedes -
company K H D
engine F 8 L 413 W
(180 PS)

1 - 8 - 7 - 2 - 6 - 5 - 4 - 3 ie 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 1,9 + 0,1 mm (from BDC) max. RW

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,0 - 5,5	0,4			
	6	1,3 - 2,1				
200	6	0,1 - 0,9				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

RQ 250/1200 AB867DL
300/1200

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications rev/min 5		Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9		rev/min 11	Control rod travel mm 12
600	15,6-16,4	600	16,0	1240	13,0-13,4	550	0	150	6,4-8,1	750	15,8-16,0
				1270	6,5-12,0			300	3,4-5,7		
				1300	0,5-9,0			400	0 -1,5	1000	13,4-13,7
				1370	0			450	0		

Torque-control travel on flyweight assembly dimension a = 0,8 mm Speed regulation at 1240 - 1250 = 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3	rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000strokes 7
1200	67,5 - 69,5	600	1000	67,0 - 70,0	100	ca. 15 mm RW
			800	74,5 - 77,5		

Checking values in brackets

9.75

BOSCH

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Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 110/320 RS 138 RQV 200-1100 PA 99 /2 R (1)
 RS 138 RQV 250-1100 PA 233/2 R (1)
 A.. RS 138 Z RQV 200-1100 PA 99 /2 R (2)
 RS 138 Z RQV 250-1100 PA 233/2 R (2)
 RS 138 EP/RSV 200-900 P 1/305R(3)

supersedes 11.73
 Volvo
 company: Volvo-Penta
 engine: D 100 B (1)
 HD100 D (2)
 MD100 B (3)

**

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6+0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	14,8-15,5	0,5			2,5±0,1* (max. 2,2-2,9)
600	9	7,6- 8,8				
	12	14,0-15,7				
	15	19,3-21,4				
200	9	5,1- 6,3				

Adjust the fuel delivery from each outlet according to the values in .
 * In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

B. Governor Settings

RQV .. PA 99/2

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150	15,5-18,3				ca. 23	100	7,0-10	1100	7,8
	1410	0					200	5,0-8,4		
ca. 66	1100	15,0-18,0					300	2,4-5,2		
	1200	7,2-12,6					400	0 -2,2		
	1260	2,0- 9,0					460	0		
	1400	0								

RQV .. PA 233/2

ca. 50 1170 15,0-18,3
 1400 0
 ca. 45 1100 15,1-17,9
 1180 8,2-13,3
 1260 0 - 7,8
 1360 0

ca. 13 100 8,9-11 1170 8,3
 200 7,2-9,9
 300 4,0-6,9
 380 0 -3,4
 490 0

** Port-closing test with/without ROBO diaphragm

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm		
1	2	3	4	5	6	7	8	9	10	11		
ca. 50	900	16,0	without auxiliary spring			ca. 24	200	6	900	0		
	950	12,0					100	19 - 21			350	0
	1000	6,6					200	5,7-6,3				
	980	7,2-10,2					300	0 - 2,4				
	1020	1 - 6										
1100	0 - 1	with auxiliary spring										

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(1 - D 100 D - S 138)		1160-1170*	100	ca. 320				
700	109,0-111,0		200	10,0-14,0)	*	/ 200		
(2 - HD 100 D - S 138 Z)		1160-1170*	****	max. 2,5)	***			
700	87,0- 89,0		250	10,0-14,0)	*	/ 250		
(3 - MD 100 B - mit EP/RSV			****	max. 2,5)	***			
ca. 10 mm RW-Carry out adjustment on engine								

Checking values in brackets

When checking extend by ± 1 cm³ (col 2 and 5)!

* 1 mm less control rod travel than col 2

** dispersion

Bei RQV..PA 99/2 R Note sleeve position

*** Idle speed

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col 2

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/720 RS 4,5, 15 RQ 250/1100 P 10 D, 11 D

supersedes

company:

Daimler-Benz
OM 346
(180 PS)

engine:

See page 2

See Service Information VDT-WPP 115/1

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3				
	9 6	5,9 - 6,7 2,6 - 3,4				
200	9 12	2,5 - 3,3 6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12	
600	15,6-16,4	600	16	1100	15,7-16,0	500	0	100	7,0-8,0	-	-										
				1120	14,5-16,0			200	6,7-7,6												
				1150	10,4-14,0			250	6,0-6,6												
				1200	3,0- 5,0			300	4,5-5,5												
				1260	0			400	0,7-2,4												
								460	0												

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		Starting fuel delivery Idle speed rev/min 6		cm ³ /1000 strokes/mm 7		Control rod travel mm 8	
1090	89,0 - 91,5	500		700	79,5 - 83,0	300	Idle delivery : 2,1 - 2,3								
				450	72,5 - 77,0										

Checking values in brackets

Special notes on testing

1. Testing is performed with inertia flywheel EPKG 4 P 1 Z and flushing of fuel gallery. (Inlet on back of pump at boss of first pump barrel viewed from drive end. Return via overflow valve EPVE 176 P 2 Z likewise on back of pump at boss of 6th barrel).
2. Basic setting of governor:
Breakaway not before $n = 1100 \text{ min}^{-1}$. At $n = 1200$, the control-rod travel must not exceed a maximum of 8 mm.
3. Idle-speed regulation:
Check whether control-rod travel 6.0 - 6.6 is obtained at $n = 250 \text{ min}^{-1}$ (value in box, Section B, columns 9 and 10) and also whether control-rod travel is increased by at least 1.5 mm when reducing speed to $n = 100 \text{ min}^{-1}$.
4. Setting of full-load delivery:
Following setting at $n = 1090 \text{ min}^{-1}$, it is to be ensured that the full-load control-rod travel is not regulated by more than 1 mm at $n = 1125 - 1130 \text{ min}^{-1}$. The control-rod travel must be between 3 and 5 mm (value in box, Section B, columns 6 and 7) after increasing speed to $n = 1200 \text{ min}^{-1}$. If this is not the case, adjust governor springs and check idle-speed regulation again (item 3).
5. Setting control-rod stop:
With lever position determined as per item 4, reduce speed to $n = 500 \text{ min}^{-1}$ and read off control-rod travel. Then set stop such that at $n = 400 \text{ min}^{-1}$ same control-rod travel is obtained as previously with $n = 500 \text{ min}^{-1}$. The stop is to be set very "sensitively", so that the full-load/torque-control profile as of $n = 700 \text{ min}^{-1}$ is not influenced by excessive pressure. Particular attention is to be paid to proper functioning/freedom of movement of the stop.
6. Starting fuel delivery:
Replace guide bushing EPMB 61 P 2 ... 6 x accordingly if the values in Section C, column 7 (top) are not attained.

Test Specifications Fuel Injection Pumps (1A) and Governors

40

VDT-WPP 001/4 PEN 7,0 a
2. Edition

En

PE 6 P 110/320 RS186 EP/RSV 250-1250 P2/358 2R (1)
PE 6 P 100 A 320 RS 54 EP/RSV 200-1250 P1/305 R (2)

supersedes 12.72
company Volvo-Penta
engine D 70 B

Port-closing test with/without ROBO diaphragm
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

See page 2

A. Fuel Injection Pump Settings

Port closing at prestroke $2,6 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,2-16,0	0,6 0,5	12	11,3-12,3	2,5 ± 0,1* (max. 2,2-2,9)
600	9	8,8- 9,6		6	0,5- 1,2	
	12	15,2-17,0		9	4,6- 5,8	
	15	17,7-19,6		12	10,8-12,2	
200	9	6,1- 7,3		9	2,8- 4,0	

Adjust the fuel delivery from each outlet according to the values in
In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

B. Governor Settings

EP/RSV..P2/358/2R (1)

① Upper rated speed rev/min Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	Intermediate rated speed			④ Control-lever deflection in degrees 7	Lower rated speed		③ Torque control rev/min 10	Control rod travel mm 11					
			4	5	6		rev/min 8	Control rod travel mm 9							
ca. 50	1250	16,0	without auxiliary spring			ca. 19	250	6,0	1230	0					
②a	1300	12,4				with auxiliary spring					ca. 19	150	19 - 21	450	0
	1380	5,6										250			
	1350	6,2-9,4	300		4,6-5,3										
	1400	2,9-5,8	400		1,0-3,3										
	1530	0,3-1,0	520		0 -1,0										
									310	1,2-1,8					

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop Test oil temp 40°C (104°F)		⑥ Rotational-speed limit Note changed to) rev/min 3	③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
rev/min 1	cm ³ /1000 strokes 2		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1) 700	0,6 kp/cm ² 131,0-133,0 (130,0-134,0)	1270	700	0 kp/cm ² 66,0-70,0 (65,0-71,0)	250	dispersion max. 3		

Checking values in brackets

* 1 mm less control rod travel than col 2

11.73

Testoil-ISO 4113

B. Governor Settings

EP/RSV .. P1/305 R (2)

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.73	1250	16,0	without auxiliary spring			ca.27	200	6,0	1230	0
	1300	11,5					100	19 - 21		
	1350	5,4					200	5,7-6,3		
							250	3,5-4,6		
2a	1320	7,6-10,5	with auxiliary spring				350	0 - 1	240	1,2-1,8
	1350	3,4- 6,4								
	1430	0,3- 1,0								

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit.		3a Fuel delivery characteristics		Starting fuel delivery idle		5 Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
(2) 700	79,0 - 81,0	1270	-	-	225	11 - 15	dispersion max. 2,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

Setting of smoke limiter: (only for pump 186 with governor P2/358/2R) (1)

Basic adjustment of pump and governor without smoke limiter.

To test Section C, attach smoke limiter and connect compressed-air line to diaphragm housing.

At high charge-air pressure (in excess of 0.6 kp/cm²) the control-rod travel must be greater than that required for full-load delivery with charge-air pressure. Then adjust full-load delivery at 0.6 kp/cm² by means of adjusting screw in governor.

Set full-load delivery without charge-air pressure (0 kp/cm²) at adjusting screw of bell crank in smoke limiter.

Set stop screw in housing of smoke limiter such that there is 0.3 mm play between housing screw and screw in bell crank at max. charge-air pressure and max. full-load delivery.

Adjustment of guide sleeve (spring seat) in diaphragm housing:
Check start of adjustment and end of adjustment of smoke limiter at n = 700 min⁻¹ -

Start of adjustment = 0.18 - 0.22 kp/cm²
End of adjustment = 0.46 - 0.50 kp/cm²

Effect correction by turning guide sleeve of helical spring.

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 110/721 RS 108 RQ 250/1300 PA 65 DR
(A) RS 108 RQ 300/1300 PA 65 DR,134DR
RS 195,Z RQ 300/1300 PA 134 DR
RS 156,Z RQV250-1300 PA 114 DR

supersedes 12.70
company: S t e y r
engine: WD 614.60-230 PS
"Z"WD 614.69-250 PS
"Z"WD 614.79-250 PS

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,8 - 10,5	0,5			
600	9	3,2 - 4,2				
600	12	8,2 - 9,4				
600	15	13,7 - 15,3				
200	9	1,1 - 2,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ ..

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
250/1300 PA DR	550 15,7-16,3	550	16,0	1320	14,6-15,0	510	0	100	6,3-8,1 *	a = 0,3 mm	700 15,8-16,0
				1350	7,4-13,4			200	4,7-6,9		800 15,3-15,6
				1380	0 - 9,0			300	2,0-4,3		950 15,0-15,2
				1440	0			410	0 *	a = 0,3 mm	
300/1300 PA65DR											

* Torque-control travel on flyweight assembly dimension a = mm

Speed regulation At		1 mm less control rod travel	
600	15,7-16,3	600	16,0
1320	14,6-15,0	550	0
1350	8,0-13,8	100	7,1-8,1
1380	0,3- 9,6	200	5,9-8,1
1450	0	300	3,7-5,8
		460	0
300/1300 PA134DR			
600	15,7-16,3	600	16,0
1320	15,0-15,4	550	0
1350	8,0-13,8	100	6,8-8,1
1380	0,3- 9,6	200	5,9-8,1
1450	0	300	3,5-5,8
		460	0

En

Testoil-ISO 4113

B. Governor Settings

1 Degree of deflection of control lever 1	Upper rated speed rev/min		Intermediate rated speed			4 Control-lever deflection in degrees 7	Lower rated speed		3 Torque control	
	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6		rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 66	1300	15,0-17,6	-	-	-	ca. 10	150	6,4-8,0	1300 1100 900 600	0,3-0,5 0,6-0,8 0,9-1,1
	1350	11,0-14,8					300	3,0-5,2		
	1400	6,4-12,0					400	2,1-3,5		
	1470	0 - 7,3					550	1,2-2,4		
	1570	0					780	0		
2a	Torque-control travel a = 1,0									

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limitat. Note: changed to ...)	3a Fuel delivery characteristics		Starting fuel delivery 5 Idle		4a Idle stop	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
PE..	108, 156, 195	- RQ +	RQV:					
1300	0,6 kp/cm² 115,0-117,0	1320(RQV)	900	0,6 kp/cm² 111,5-114,5	100	12 -13		
1300	0 kp/cm² 111,0-113,0		700	110,0-114,0				
PE..	156Z + 195Z	- RQ +	RQV:	98,0-104,0				
	0,6 kp/cm²	1320(RQV)		0,6 kp/cm²	100	12 -14		

Checking values in brackets

1300	117,0-119,0	900	114,5-117,5
	0 kp/cm²	700	114,0-118,0
1300	113,0-115,0	500	104,0-110,0

* 1 mm less control rod travel than col. 2

Setting of smoke limiter:

- Basic adjustment of pump and governor (Section A-B) without smoke limiter.
- Adjust full-load delivery (quantity indication with charge-air pressure) at full-load stop screw of governor, check fuel-delivery characteristics.
- Attach smoke limiter; adjustment test at 500 min⁻¹. Set start (0.3 kp/cm²) and end (0.46 kp/cm²) at guide sleeve (spring seat); difference between induction and pressure-charging approx. 0.6 mm control-rod travel.
- Set full-load delivery at 0 kp/cm² on bell crank of smoke limiter.
- Correct full-load delivery -0.5 cm³ at 500 min⁻¹ and 0.5 kp/cm² at housing of smoke limiter; measure fuel-delivery characteristics at increasing engine speeds.

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 DAI 10,8 q
Edition 2.64

En

PE 6 P 100/720 RS 15

RQV 250-1100 P 12 D
P 13 D
* PA20 DR

supersedes
company:
engine:

Daimler-Benz
OM 346
(210 PS)

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3				
	6	2,6 - 3,4				
	9	5,9 - 6,7				
	9	2,5 - 3,3				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1100	15 - 17,8	-	-	-	ca. 10	150	7,5- 8	1100	0
	1120	12,6-16					250	5 - 7	900	0,2-0,4
	1150	9,5-13,7					350	3,4-3,8	700	0,3-0,5
	1200	3,2- 9,6					500	2,2-3,8	500	0,4-0,6
	1250	0 - 5,2					600	1,1-2,4		
	1300	0					730	0		

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1090	100,5-102,0	1110-1120	900 700 450	98,5-100,5 99,5-102,0 87,5- 91,0	100	15 - 16		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

BOSCH

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Special notes on testing

1. Testing is performed with inertia flywheel EPKG 4 P 1 Z and flushing of fuel gallery. (Inlet on back of pump at boss of first pump barrel viewed from drive end. Return via overflow valve EPVE 176 P 2 Z likewise on back of pump at boss of 6th barrel).
2. Testing and adjustment of governor and full-load delivery as per WPP 001/4, however the following additional test is to be performed after setting the full load.

At $n = 600 \text{ min}^{-1}$ and with control lever in full-load position, read off control-rod travel and then slowly move control lever in STOP direction. The control-rod travel must not be subject to further increase in the process.

En

Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 110 / 821 LS 139 RQ 250/1100 PA 96 D
PE 6 P 110/ 821 LS 182 RQ 250/1100 PA 96 D
PE 6 P 110/ 821 LS 139Y RQ 250/1100 PA 96 D
PE 6 P 110A 821 LS 139 RQV250-800/1100 PA 149

supersedes 12.72
company: Büssing
engine: U 12 DA 62
(310 PS-1,4)
(280 PS-2)
(320 PS-3)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) Cyl. 6

(+0,15
-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,7 - 13,4	139	12	14,3 - 15,1	182
600	9	6,1 - 7,3		9	8,0 - 9,2	
600	12	11,9 - 13,4		12	13,3 - 14,8	
600	15	16,5 - 18,2		15	17,7 - 19,4	
200	9	4,2 - 5,4		9	5,8 - 7,0	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

RQ.. 96 D

Checking of slider PRG check rev/min 1		Control rod travel mm 2		①		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications rev/min 6		④		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 10		⑤		Torque control rev/min 11		Control rod travel mm 12		③		
500	15,7-16,3	500	160	1120	15,6-16,0	480	0	150	6,7-8,1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				1150	10,0-14,0			250	4,2-6,3																			
				1200	0 - 7,5			350	0 -2,2																			
				1260	0			390	0																			

Torque-control travel on flyweight assembly dimension a = 0 mm

Speed regulation: At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		cm ³ /-1000 strokes 2		②		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		cm ³ /-1000 strokes 5		③b		Starting fuel delivery Idle speed rev/min 6		⑥		Control rod travel mm 7		
		0,6 bar		--		0	bar															
1100	168,0 - 172,0	(1)		1100	106,0-110,0	100	ca.24															
1100	162,0 - 166,0	(2)		1100	108,0-112,0	100	ca.24															
1100	171,0 - 174,0	(3)		1100	109,0-113,0	100	ca.24															

Checking values in brackets

12.74

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1100 1150 1200 1270	14,0-16,0 7,0-12,4 0 - 7,4 0	ca.62	700 800 900 1100 1150	14,5-17,0 6,8- 9,6 0,6- 1,0 0,6- 1,0 0	ca.12	150 250 350 500	6,4-8,0 3,7-6,0 0,7-1,9 0	200 350 700 900- 1100	0,2-1,3 2,0-3,4 5,8-6,2 8,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
0,6 1100	bar 174,0-177,0	1120	0 1100	bar 106,0-110,0				

Checking values in brackets

* 1 mm less control rod travel than col. 2

Setting of manifold-pressure compensator (LDA):

- Basic adjustment of pump and governor (Section A-B) without LDA.
- Set full-load delivery (data with charge-air pressure) at full-load stop screw of governor.
Check fuel-delivery characteristics if applicable.
- Attach LDA.
- Set start of adjustment at guide sleeve (spring seat) of diaphragm housing.
- Set full-load delivery (data without charge-air pressure) at bell crank of smoke limiter.
- Correct full-load delivery minus 0.5 cm³ with full-load travel and at full-load speed using hexagon bolt of housing - max. charge-air pressure.
- Check end of adjustment.
- Stop adjustment - n = 500 min⁻¹ - increasing pressure in bar:

	Item (1, 3)	(2)	(4)
Setting	0.02-0.04	0.04-0.07	0.01-0.04
Measurement	0.52-0.55	0.46-0.50	0.52-0.54
Difference in control-rod travel	approx. 4.9	approx. 3.6	approx. 4.4 mm

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ② and Governors

En

PES 6 P 100 A 820 LS 264 RQ 300/1100 PA 186 D
LS 264Z (V10692,Z) (V11490D)

supersedes
company: Daimler-Benz
engine: OM 407 h
(180PS,210PS)

See page 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) Cyl.6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,5 - 10,2	0,4			
600	9	3,1 - 4,3				
600	15	13,2 - 15,7				
200	9	1,4 - 2,4				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		① Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		④ Control rod travel mm 4		Test specifications rev/min 5		⑥ rev/min 6		Idle speed regulation Setting point rev/min 7		⑧ Control rod travel mm 8		⑤ Test specifications rev/min 9		⑩ Control rod travel mm 10		Torque control rev/min 11		⑬ Control rod travel mm 12	
600	15,7-16	600	16,0	1110	15,6-16,0	550	0	220	7,0-8,1	-	-												
				1150	5,4-12,5			300	4,9-7,2														
				1180	0 - 8,2			380	1,6-4,2														
				1230	0			450	0														

Torque-control travel on flyweight assembly dimension a = 0 mm Speed regulation: At 1145-1165 1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		② cm ³ /-1000 strokes 2		Control rod stop rev/min 3		③a		Fuel delivery characteristics rev/min 4		③b		Starting fuel delivery Idle speed rev/min 6		⑥ Control rod travel cm ³ /1000 strokes/mm 7	
1100	89,0 - 91,0 (88,0 - 92,0)	600										100	13,5 - 15,5		
"Z" 1100	109,0 - 111,0 (108,0 - 112,0)	600													

Checking values in brackets

Test sequence for pump .S 264:

On account of the special flange, this fuel-injection pump cannot be clamped on to the test bench with the existing holding pieces. A special test sequence is thus necessary:

1. Detach drive flange with KDEP 1033; remove pointer and clamping flange.
2. Screw on flange EFEP 157/7 - 1 685 720 060 and insert it into universal clamping bracket EFEP 157 (125 mm) or EFEP 157 A (110 mm).
- Tighten clamps.
3. Fit supporting frame EFEP 433 (110 mm) - 1 688 030 030
EFEP 444 (125 mm) - 1 688 030 033 on governor
end.
4. Install driving coupling for test bench and perform test in accordance with WPP 115/1 (pump) and WPP 001/4 (governor) - as usual -, however
5. remove clamping flange and clamping bracket following completion of test. Governor-end supporting frame and fuel-injection tubing as well as inlet line remain closed. Fit motor flange with pointer and drive flange.
6. Attach prestroke measuring device to cyl. 6.

Set start of delivery in accordance with high-pressure overflow method and transfer pointer mark to drive flange.

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

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PE 8 P 110/920/4 LS132	RQV 225-1150 PA88R	(1)	supersedes	12.71
PE 8 P 110A920/4 LS207			company:	Scania
PE 8 P 100/920/4 LS133	RQV 225-1150 PA89R	(2)	engine:	DS 14 (1)
PE 8 P 110A920/4 LS208	RQV 225-1150 PA89R	(3)		D 14 (2,3)

Port-closing test with/without ROBO diaphragm
Cam sequence and angular cam spacing. 1-2-7-3-4-5-6-8 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 11 Ø cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery 10 Ø cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,8 - 13,6	0,6	12	11,4 - 12,2	2,5 ± 0,1*
600	6	0,8 - 1,8		9	5,4 - 6,6	(max. 2,2-2,9)
600	12	12,2 - 13,7		12	10,6 - 12,1	
600	15	17,2 - 18,8		15	15,3 - 17,1	
200	6	0,6 - 1,6		9	3,6 - 4,6	

Testoil-ISO 4113

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV .. PA88, 89 (1..3)

Upper rated speed				Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Control rod travel rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	3a	4	5	6	7	8	9	10	11
ca. 66	1210	14,8-17,6		-	-	-	ca. 10	100	6,6-8,0	1220	8,3
	1300	9,1-13,4						250	4,0-5,8		
	1400	1,8- 8,2						400	1,5-2,9		
	1540	0						510	0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
0,7 kp/c. ²				0,7 kp/cm ²	100	190 - 240		
1100	162,0-164,0	1170		600 158,0-161,0	225	10 - 12		
(14±0,5 mm RW)				0 kp/cm ²		** max. 1,5))*(ca. 6mmRW
				500 135-139,0	1800	49 - 53) (ca. 6mmRW
						** max. 4		

Checking values in brackets

** dispersion

* 1 mm less control rod travel than col. 2
10.74

B. Governor Settings

Testoil-ISO 4113

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1210	14,8-17,6	-	-	-	ca.10	100	6,6-8,0	1220	8,3
	1300	9,1-13,4					250	4,0-5,8		
	1400	1,8- 8,2					400	1,5-2,9		
	1540	0					510	0		
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.	③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Notes: changed to ...) rev/min	rev/min		rev/min		rev/min	
rev/min	cm³/1000 strokes		4	5	6	7	8	Control rod travel mm
1	2	3	4	5	6	7	8	9
(2)					100	190 - 240		
1100	114,0-116,0	1170	600	110,0-114,0	225	10 - 12		
(12)	0,5 mm RW				1200	** max. 1,5)*	
						46,5-51,5)	
						** max. 4)	
(3)					225	9 - 11)* (ca. 6mmRW)	
1100	117,0-119,0					** max. 1,5)	
(11)	0,5 mm RW)	

Checking values in brackets

** dispersion

* 1 mm less control rod travel than col. 2

1200 45-49

** max. 4) (ca.6 mm RW)

Setting of manifold-pressure compensator (LDA) - only with PA 88 R:

Basic setting of pump and governor (Sections A - B) without LDA. Attach LDA: At 500 min⁻¹ and 0 kp/cm² (without charge-air pressure) set full-load delivery at stop screw of bell crank.

By pressing on diaphragm (connect up compressed air), adjust stop such that there is more control-rod travel than is required for full-load delivery with maximum charge-air pressure.

Then set full-load delivery at stop screw in housing at 1100 min⁻¹ and 0.7 kp/cm² and measure fuel-delivery characteristics.

Check difference in control-rod travel between pressure-charging and induction = approx. 1.2 mm.

Stop adjustment (decreasing pressure):

The full-load control-rod travel must have decreased by 0.1 mm at 0.27 - 0.29 kp/cm² (197-213 mmHg) and 500 min⁻¹.

The full-load control-rod travel must have decreased by 0.8 mm at 0.18-0.21 kp/cm² (130-154 mmHg) and 500 min⁻¹.

Adjust by altering initial tension of spring, i.e. turn guide bushing of helical spring.

Test Specifications Fuel Injection Pumps ① and Governors

PES 6 P 110/720 RS 135

RQV 275-1050 PA 92 KR
PA130 KR

supersedes
company:
engine:

Mack
ENDT 675

Test equipment: nozzle DLL 155 S 482 = 230 bar
Nozzle-holder assembly KBL 90 S 119/4 fuel lines 6 x 2,1 x 920 mm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	14,5 - 15,0	0,6			
600	6	3,5 - 4,6				
600	12	15,7 - 17,2				
600 200	15 6	20,7 - 22,5 2,7 - 3,8				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a	Degree of deflection of control lever 4	rev/min Control rod travel mm ④	Degree of deflection of control lever 7	rev/min Control rod travel mm ③	8	9	①	10	11
ca. 66	1050 1100 1180 1260	15,0-17,7 10,0-14,0 0 - 7 0	-	-	-	ca. 10	200 300 450 680	7,3-8,0 3,7-5,6 1,9-3,2 0	1050 800 600 500	11,8 12,3 13,2 12,9		
						③a						

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control travel ⑤			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	④a	rev/min cm ³ /1000 strokes 4	5	rev/min cm ³ /1000 strokes 6	7	8	9
1050	136,0-140,0	1070		800 600 500	154,0-159,0 177,5-183,5 169,0-175,0	100 275 1140	ca. 165 17 - 19		
									./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

Sliding sleeve travel	U/min	mm RW
	100	0
	256	0 - 1
	400	2,1 - 2,7
	700	3,9 - 4,4
	1000	7,3 - 7,7
	1180 - 1260	11

Testoil-ISO 4113

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